Mapping of leverage points and transformative pathways for upscaling at the EU and global context produced for 5 sectors

Deliverable number: D4.2

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PLANET4B

BETTER DECISIONS FOR BIODIVERSITY AND PEOPLE

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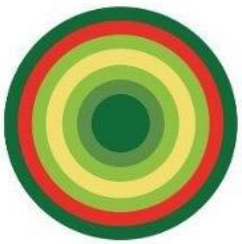

PLANET4B

BETTER DECISIONS FOR BIODIVERSITY AND PEOPLE

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List of abbreviations and acronyms

Acronym	Definition
CAP	Common Agricultural Policy
CBD	Convention on Biological Diversity
CG	CzechGlobe – Global Change Research Institute of the Czech Academy of Sciences
CSA	Community Supported Agriculture
CSDDD	Corporate Sustainability Due Diligence Directive
CSOs	Civil Society Organisations
CSRD	Corporate Sustainability Reporting Directive
ESG	Environmental, Social, and Governance
ESSRG	Environmental Social Science Research Group
EU	European Union
EUDR	EU Deforestation Regulation
FiBL	Research Institute of Organic Agriculture
GVC	Global Value Chain
IFOAM	International Federation of Organic Agriculture Movements
IFZ	Interdisciplinary Research Centre for Technology, Work and Culture
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPLC	Indigenous Peoples and Local Communities
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
IUCN	International Union for Conservation of Nature
LC	Learning Communities
LP	Leverage Points
NGT	New Genomic Techniques
NINA	Norwegian Institute for Nature Research
PES	Payment for Ecosystem Services
PGRFA	Plant Genetic Resources for Food and Agriculture
PLANET4B	understanding Plural values, intersectionality, Leverage points, Attitudes, Norms, behaviour and social lEarning in Transformation for Biodiversity decision making
RU	Radboud University
SB	Stakeholder Board
SDGs	Sustainable Development Goals
SM	System Mapping
TNFD	Taskforce on Nature-related Financial Disclosures
UN	United Nations
UNDROP	UN Declaration on the Rights of Peasants and Other People Working in Rural Areas
UNEP FI	UN Environment Programme Finance Initiative
UNEP-WCMC	UN Environment Programme World Conservation Monitoring Centre
UNIPI	University of Pisa
WP	Work Package

Table of Contents

Executive summary

- This report maps leverage points and transformative pathways for enhancing transformative change in five sectors –agriculture, finance, trade, education, and fashion– across both EU and global contexts, based on the analysis conducted within the PLANET4B project and drawing from six extensive sector-based cases within this project.
- The methodologies employed included participatory approaches (featuring workshops and stakeholder engagement to facilitate the identification of specific desired interventions in six sector-based case studies) and additional review of policies that are of most relevance to the six sector-based case studies.
- Key leverage points identified as most crucial within sectors for facilitating transformative change include supportive legal frameworks, financial resources, community engagement, and international collaboration, while significant barriers such as economic constraints and resistance from established interests were also identified.
- The report concludes with recommendations aimed at enhancing policy integration for all these five sectors, standardising biodiversity metrics (for reporting impact), raising consumer awareness, and fostering global partnerships to ensure effective implementation of transformative initiatives across all sectors.

1 Introduction

Elif Tugba Simsek, Patricia Ofori-Amanfo, Blanka Loučková

This report examines leverage points and transformative pathways aimed at supporting transformative change across five sectors, namely agriculture, finance, trade, education, and fashion, within the scope of Task 4.2 of the PLANET 4B project. The document starts with an introduction that clarifies key concepts and outlines the main objectives of the task. The methodology section of the report focuses on data collection and analysis methods employed to identify leverage points and generate transformative pathways for institutional change for each case. This is followed by an overview of these case studies that illustrate their specific goals, key stakeholders and desired interventions. The results section outlines the transformative pathways and leverage points identified, which leads to a thorough discussion comparing the similarities and differences among sectoral pathways, as well as exploring the enabling and disabling factors affecting transformative change, concluding with policy recommendations for promoting transformative change.

The PLANET 4B project engaged a broad and diverse array of research-based case studies from within and beyond Europe, divided into two clusters (intensive place-based and extensive sector-based cases) to co-create knowledge on the behavioural and institutional aspects of system-wide transformations for biodiversity. This report

mainly focuses on insights gathered from extensive sector-based case studies, outlining the transformative pathways and leverage points identified by these cases.

Institutional analysis fundamentally studies how institutions influence and shape social, economic, and political interactions. These institutions can be defined formally through laws, policies, or procedures, or they may develop informally as norms, standard operating practices, or habits (Polski and Ostrom (1999). Considering institutional dynamics with an emphasis on policy implications, this report aims to provide insights into a broader perspective, as the sector-based case studies focus on more specific sectoral contexts within their particular communities. This leads to a thorough discussion comparing the similarities and differences among sectors, as well as exploring the enabling and disabling factors affecting transformative change, concluding with recommendations for promoting sustainability initiatives and transformative change.

1.1 Definition of key terms

Patricia Ofori-Amanfo

This section of the report provides definitions to key concepts relevant to this deliverable as a means of orienting the reader to the content captured in it.

a) Intervention

Intervention as used in the PLANET4B project refers to methods supportive of triggering a change. These broadly encompass classical interventions including regulatory (laws), market-based (policies with incentives, taxes), and advisory-voluntary (education, awareness raising, etc.) interventions. Interventions also refer to methods deployed to change people's perception, understanding, attitude and/ or behaviour. The PLANET4B project basically employs interventions identified in the latter definition. Based on this, the project identifies three main complimentary sets of intervention methods which the extensive sector-based cases could choose from to employ in their cases:

1. Transformative methods of experiential games for social learning, behavioural and institutional change
2. Behavioural framing and nudging experiments
3. Deliberative, creative and arts-based methods

Interventions can be targeted at any leverage points to unlock change in the system. It is worth noting that intervention methods employed by the six (6) extensive sector-based cases could vary considerably reflecting differences in social factors, local languages and priority in biodiversity issues. Particularly relevant to the discourse on interventions as employed in the PLANET4B project, are the deliverables: Deliverable 2.1 ('Directory of key methods most suitable for biodiversity decision-making contexts') and Deliverable 2.2 ('Report on pre-test and pre-validation of contextualised intervention methods').The two deliverables produced under WP2 ('Mapping and

advancing transformative and creative methodologies to behavioural and institutional change'), provide insights on key interventions appropriated in making decisions in biodiversity contexts and the processes undertaken to model interventions to suit each case study in the PLANET4B project, respectively.

b) Leverage points

From a systems thinking perspective, leverage points are places in a system where we can intervene to change the system towards more sustainable outcomes. Based on system properties, Meadows (1999) originally outlined a series of twelve (12) points to intervene in a system to create change. Inspired by the work of Meadows Abson et al. (2017), categorised the twelve (12) leverage points into four (4) broad system characteristics: 1) materials 2) processes 3) design and 4) intent (Fig.1). Beginning from the shallowest to deepest, ***materials*** refer to the flows of matters within the system, such as money or fabrics and other resources. **Processes** are the feedbacks or procedures that move materials around the system. **Design** relates to the structures, actors and organisations in the system and how they interact with each other. **Intent** encapsulates the worldviews and paradigms that are being embodied and enacted by the system.

According to the leverage points framework each of these characteristics can be targeted with specific interventions to unlock change. However, it is worth noting that, shallow leverage points including "materials" and "processes" are relatively easy to see and target but have minimal impact on the overall functioning of the system. On the other hand, deeper leverage points in the form of "design" and "intent" are harder to see and target for change but targeting them creates more fundamental change in the system.

Deliverable 3.2 ('Report on the system mapping and leverage point for each case') presents the leverage points identified by all the eleven case studies in the PLANET4B project as necessary, to trigger transformative change in biodiversity decision making.

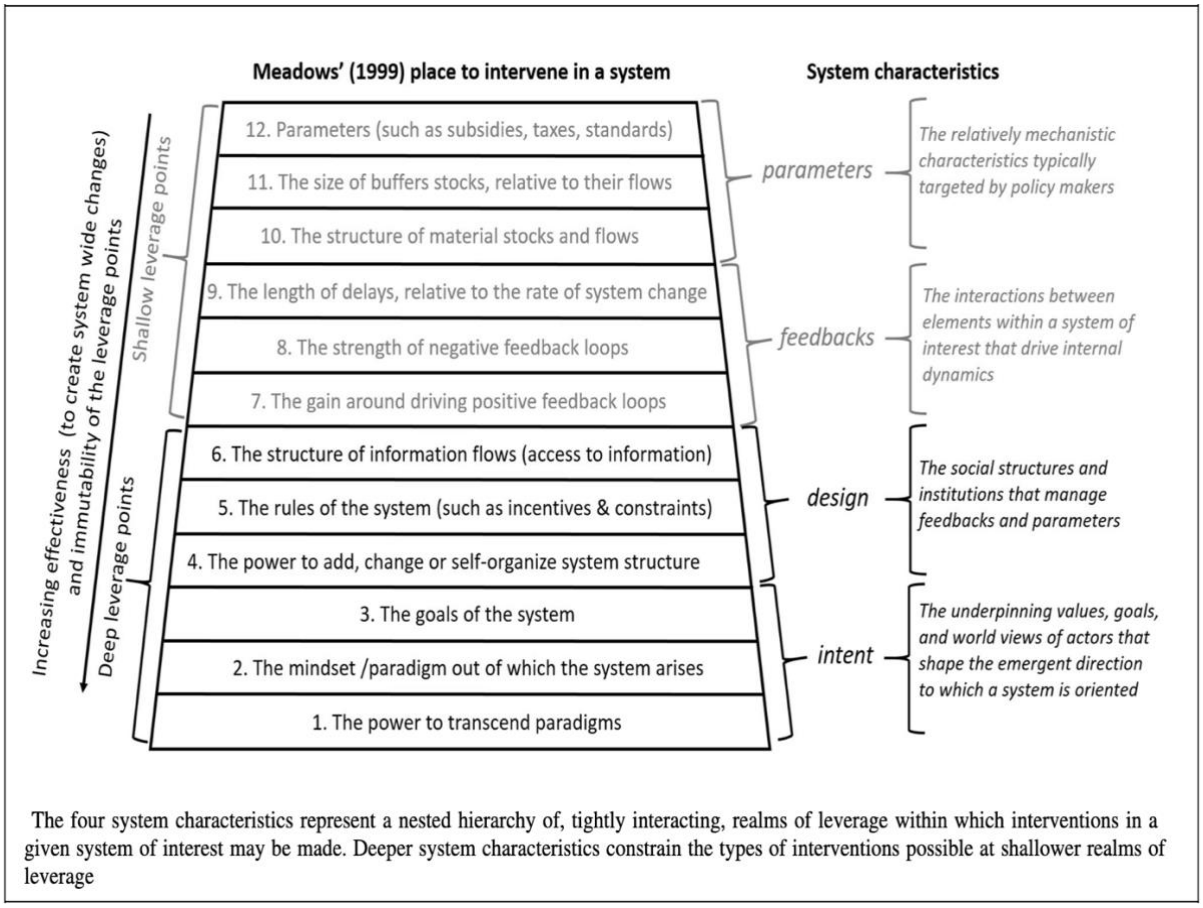

Fig 1. Meadows' 12-leverage points framework aggregated into four broad categories of system characteristics for targeted interventions, ranging from shallowest to deepest: parameters, feedback, design and intent. (Source: Abson et al., 2017).

c) Transformative pathways

Transformative pathways as used in this project refers to the trajectories proposed towards the achievement of goals (set by each extensive sector-based case) through interventions for prioritisation of biodiversity for sustainable outcomes. The concept of pathways has grown in popularity to examine how specific sustainability objectives in various sectors can be met (e.g. Rosenbloom, 2017; Frantzeskaki et al., 2012; Tabara et al., 2018). This approach enables us to formulate proactive responses to complex sustainability challenges such as biodiversity loss while considering combined effects of short-term, medium-term and long-term actions. By taking these into consideration we are able to provide concrete guidance regarding the multitude of actions as well as relevant stakeholders necessary for sustainability in biodiversity conservation. We acknowledge this involves systemic changes from local practices to global policies and collaboration across multiple sectors, scales and stakeholders. A well-known approach to creating pathways involves using concrete interventions targeting a combination of leverage points in the system to create change (Otero et al., 2024), which is employed in this project.

1.2 Connecting leverage points, policy mapping, and transformative pathways

Elif Tugba Simsek

Task 4.2 builds on the insights generated through the collaborative workshops of the extensive sector-based cases in Task 3.2 of the PLANET 4B project, where case studies and stakeholders from various sectors engaged in system mapping, leverage point identification, and intervention assessment for sustainable transformative change for biodiversity. By synthesising these findings for EU and global contexts, Task 4.2 designs transformative pathways for upscaling at the EU and global levels, specifically for five sectors: agriculture, finance, trade, education, and fashion.

Task 4.2 focuses on the leverage points for specific sectors and conducts an institutional analysis, particularly concerning policy aspects, to establish transformative pathways. Indeed, policy mapping is a crucial component of institutional analysis as formal or informal institutions shape behaviour by creating incentives and constraints in decision-making processes. Since institutions are often abstract and embedded in policies, reviewing policies allows us to uncover the underlying rules and norms that govern social interactions. As Polski and Ostrom (1999) highlight, institutions influence policy outcomes by structuring information and guiding behaviour in coordinated settings. By focusing on existing policies relevant to specific sectors, we can thus gain insights into institutional patterns, assess their impact on social change, and explore alternative arrangements for more effective governance. In this way, policy mapping serves as an important tool for evaluating, designing, and reforming institutions to create transformative pathways.

For Task 4.2, linking leverage points to policy review within the institutional analysis highlights critical areas for intervention and provides valuable insights for understanding institutional dynamics within specific sectors. Thus, drawing from Task 3.2, leverage points are examined in relation to institutional dynamics, revealing where policy shifts, governance innovations, or structural adjustments can have the greatest transformative impact. These leverage points, in turn, inform the development of transformative pathways—strategic, sector-specific roadmaps outlining actionable steps at EU and global levels.

Policy mapping, therefore, is a core aspect of this process, which primarily involves mapping and discussing relevant policies for each sector at both EU and global levels. This process helps identify the regulatory and governance frameworks that shape each sector and also highlights barriers and opportunities for sustainable transformation. By understanding how existing policy frameworks enable or constrain change, Task 4.2 proposes concrete transformation options based on specific sectoral transformation desires of the sector-based cases.

Thus, by integrating leverage points with institutional analysis that emphasises policy aspects along with other social and economic dynamics, Task 4.2 develops sectoral transformative pathways at both the EU and global levels that are practically viable.

These pathways aim to achieve meaningful and relevant sustainable transformation outcomes for stakeholders and local communities from different countries (Hungary, Italy, Brazil-Netherlands, Norway, Switzerland) and various sectors participating in collaborative workshops, system mapping, identifying leverage points, and assessing interventions as part of Task 3.2. These pathways also guide how EU and global institutions can support large-scale transformations, ensuring that sectoral transformations promote better decisions for biodiversity

1.3 Main aim of task T4.2, linkages to other tasks in the project

Elif Tugba Simsek

"Designing Transformative Pathways at the EU and Global Levels and for Specific Sectors" in Task 4.2 plays an important role within WP4, which focuses on synthesising transformative pathways and ensuring their policy relevance. The primary aim of Task 4.2 is to integrate the results of Task 3.2 in WP3 into broader EU and global contexts while exploring opportunities for scaling transformations within specific sectors. This task builds directly on the work conducted in **Task 3.2**, **which involved systems mapping and the identification of transformative interventions.**

Task 3.2 facilitated collaborative workshops in both intensive and extensive case studies, engaging stakeholders from learning communities and advisory boards. These workshops provided valuable insights by mapping systems, identifying leverage points, assessing the potential impacts of selected interventions, and analysing potential barriers and opportunities for broader transitions. The knowledge generated through Task 3.2 created a strong foundation for understanding where and how effective interventions can be made, directly informing Task 4.2's objectives.

Task 4.2 incorporates these insights, particularly the case studies' identified leverage points and interventions, into its policy analysis, which focuses on establishing options for transformations across key sectors, including education, agriculture, fashion, finance, and trade. This analysis designs potential transformative pathways for better decisions for biodiversity at both the EU and global levels.

Additionally, in the scope of **Task 3.3, "Validating and sharing the main learning points",** the extensive sector-based cases run a validation workshop where key informants and advisory board members are invited in order to critically reflect upon the analysis and lessons provided by participants of the extensive cases. As a result, sector-specific leverage points and transformative change stories will be produced. Task 4.2 will extend this study with sector-based policy analysis to design potential pathways for both the EU and global contexts.

Within WP4, Task 4.2 also maintains strong linkages with other tasks. The policy review conducted by UNEP-WCMC within WP4 provides essential inputs on sector-based policies for Task 4.2. The findings of Task 4.2 also directly inform **Task 4.3, which focuses on validating the proposed transformative pathways with**

policymakers and business leaders through a series of workshops. The outcomes of Task 4.3 will, in turn, feed into **Task 4.4, which explores synergies and policy coherence to enhance the scalability and integration of transformative pathways.**

Overall, Task 4.2 benefits from the insights and outputs of other tasks in WP3 and WP4 while providing critical knowledge and pathways that support the design, validation, and integration of transformative solutions. This ensures alignment with the broader project objectives of fostering transformative change and promoting policy coherence across sectors and scales.

2 Methodology

Patricia Ofori-Amanfo

This section of the report focuses on data collection and analysis methods employed as pertaining to the six extensive cases under the PLANET4B project, to identify leverage points and generate transformative pathways for institutional change for each case.

The overall aim of the case studies was to systematically analyse transformation within a sector to draw transformative pathways. By examining each case study, we sought to identify leverage points and potential interventions that could facilitate transformative change. It is important to note that, data used in this report to create pathways is primarily from workshops conducted by the leaders of case studies as part of Task 3.2 within WP 3 (“Learning communities for transformative change”). This task involved leaders of each case study engaging in collaborative workshops with their respective advisory boards to identify leverage points and interventions that can instigate transformative change as well as the broader impacts of the interventions selected. Through this collaborative workshop format, the research aimed to actively involve the participants - case study leaders and advisory boards in a learning process that promotes a comprehensive understanding of the complexities unique to each case study. The following analysis involved a thorough examination of each case study data to identify a pathway that illustrates the sequence of actions to be undertaken to achieve desired outcomes at both EU and global levels. A more detailed description of the methods utilised is provided in the following subchapters.

2.1 Participatory workshops

Participants in each case study were required to undertake three (3) key exercises in the workshops (for the purpose of this report, only results from exercise 1 and 3 were used) (see *Methodology guide for extensive case studies* in Annex 1):

1) *Exercise on interventions and leverage points:* to identify the interventions and leverage points within the case study system that can be utilised to influence transformative change
2) *Exercise on indicators:* to determine the indicators necessary to measure the impact and success of the interventions
3) *Exercise on broader impact*: to explore the potential wider effects of the interventions beyond the initial scope

In executing these three exercises, the case study leaders and their advisory boards-key stakeholders with relevant knowledge and expertise in the sectors under study - convened in two online or offline workshops. Before these workshops were conducted, case study leaders completed these exercises independently and then presented the outputs to advisory boards during workshops. This approach was selected due to the potential limitations posed by a small group of participants (advisory board members). The workshops then served as a platform to discuss and review the outputs, incorporating feedback and insights from the advisory board Deliverable 3.1 ('Establishing Learning Communities and Advisory Board') provides details on the stakeholder boards and the processes involved in their selection.

The workshops were designed to give flexibility, while recognising diverse perspectives and intersectionality, aiming also to create an inclusive environment for all participants, regardless of their backgrounds. The CzechGlobe (CG) research team created a theoretically informed workshop protocol (see *Methodology guide for extensive case studies* in Annex 1), providing materials and methods, and outlining how data should be collected and recorded for each workshop. Case study leaders were able to give their input to the protocols and shape them according to their needs. They also received training in running the workshops that involved a two-hour training session (dry run) during a PLANET4B consortium meeting in Nijmegen in October 2023. Moreover, case study leaders could reach out to the CG research team during the preparation phase if they needed any assistance. The workshops were conducted in local languages by the case study leaders and consequently transcribed and sent to the CG research team.

It is worth noting that the outputs are exclusively derived from the case studies and reflect the perspectives of participants, including both personal and expert opinions.
Also, it is important to note that the interventions suggested by cases are desired interventions which were not actually implemented in cases. The complexity of the extensive case systems, which involve numerous stakeholders, regulations, and policies, complicates the feasibility of implementing specific changes in practice.

The case studies were encouraged to utilise Abson's four-point leverage point scale, which is easier to comprehend as it categorises leverage points into four distinct types. This approach was preferred by two of the cases (Sustainable finance case and Swiss agriculture & migration case) due to its simplicity and clarity. However, other cases opted to delve deeper and apply the original twelve-point Meadows leverage point

framework, which provides a more detailed and comprehensive analysis of the different dimensions of leverage points. This flexibility in using either framework allowed for a more nuanced exploration of how interventions can influence systemic change in their respective contexts, reflecting the diverse preferences and needs of the stakeholders involved in the project.

Table 1. Dates of workshops

Case study	WS1: System mapping (format of WS)	WS2: Leverage Points (format of WS)	WS3: Monitoring and Strategy (format of WS)	WS4: Barriers and Opportunities (format of WS)	No. of participants in WS
Agro-biodiversity management in Hungary (ESSRG)	24.06.2024 (online)	24.06.2024 (online)	31.10.2024 (online)	31.10.2024 (online)	5
Trade & GVCs of soy/beef from Brazil to the EU/Netherlands (RU)	25.06.2024 (Portuguese, online) 28.06.2024 (English, online)	25.06.2024 (Portuguese, online) 28.06.2024 (English, online)	25.06.2024 (Portuguese, online) 28.06.2024 (English, online)	25.06.2024 (Portuguese, online) 28.06.2024 (English, online)	5 (Portuguese, online) 4 (English, online)
"From ego-system to eco-system" in fashion in Italy (UNIPI)	28 September 2023 (online) 27 November 2023 (online)				5 5
Sustainable investment behaviour Global-EU-Norway (NINA)	1.11. 2023 (online) 4.10.2024 (online)				10
Environmental awareness in Education in Hungary (ESSRG)	25.04.2024 13.05.2024 (in-person)	25.04.2024 13.05.2024 (in-person)	24.09.2024 04.11.2024 (in-person)	24.09.2024 04.11.2024 (in-person)	5
Agriculture and migration in the EU (FiBL)	October 2024, November 2024 (online)				8

2.2 Policy mapping

Between month 6 – 12 of the PLANET4B project, in the context of WP4 "Synthesizing transformative pathways and ensuring policy relevance", UNEP-WCMC began a policy scoping exercise. The purpose of the exercise was to identify key biodiversity-related conventions and EU-level policy instruments that have most thematic relevance to the topics that the intensive place-based and extensive sector-based case studies have chosen to focus on. Whilst all of the PLANET4B case studies are exploring a range of

nexus topics (e.g. biodiversity-agriculture-labour migration), biodiversity is the central focus of all the case studies. Furthermore, given that PLANET4B is interested to understand values, intersectionality, leverage points, and behaviours in the context of “biodiversity-related decision-making", UNEP-WCMC chose to focus the scope of their policy mapping on the biodiversity-related conventions and EU policy instruments that primarily address biodiversity and/or related concepts (e.g. nature, sustainability, ecosystems). To account for the cross-cutting nature of the topics covered under the case studies as well as its key relevance as a policy instrument at the global and national levels, the 2030 Agenda for Sustainable Development and its Sustainable Development Goals was also considered within the mapping. Once a preliminary list of biodiversity-related conventions and EU policies were identified, UNEP-WCMC conducted one-to-one calls with each of the case study partners to provide an explanation and overview of the main policy instruments that may be of relevance to their case studies, to support the case studies to consider potential policy relevance when designing and conducting their case study activities.

After month 12, once the case studies had established their learning communities and advisory boards and clearly outlined their case study goals and objectives, UNEP-WCMC conducted a further analysis of the biodiversity-related policy instruments at the EU and global level, to identify the specific text, goals and targets in these policy instruments that most directly relate to the topics that the case studies are focussing on. The policy mapping was then subsequently used for the analysis of “policy alignment and gaps” in this report (see Section 4.2). The results of the policy mapping for the extensive sector-based case studies can be found in Annex 2 “Policy mapping”.

It is important to note that UNEP-WCMC’s policy mapping is not exhaustive and does not consider all policy instruments relating to the nexus topics covered by the case studies (e.g. education, finance, trade), but rather focuses on the main biodiversity-related policy instruments and how those policy instruments relate to the nexus topics covered by the case studies.

2.3 Data analysis

Findings from these workshops were collected from the case studies and thoroughly analysed by CG research team culminating into Deliverable 3.2 (‘Report on the system mapping and leverage point for each case’).

Using findings from Deliverable 3.2 and the results from the workshops, specifically Exercise 3 (*Exercise on broader impact*), descriptive analysis was conducted on the data obtained. This involved synthesising information and insights gathered during participatory workshops, focusing on identification of leverage points, and broader impacts of desired interventions as well as barriers to and opportunities for broader impacts in each case study. Alongside the results of the case studies in Deliverable 3.2, UNEP-WCMC’s policy mapping of biodiversity-related EU and global policy instruments was used in analysis to identify “action steps” for the EU and global level transformative pathways, in particular “action steps” that relate to improving and/or changing current policies and their implementation. This policy mapping was also used

for our analysis of “policy alignment and gaps”, which involved analysing to what extent current policies align with the interventions and “action steps”, and where gaps exist. It is worth noting that while in Deliverable 3.2, initial interventions for each case study were broadly identified to capture core concepts and potential areas for transformative change, for the purposes of Deliverable 4.2 (‘Mapping of leverage points and transformative pathways for upscaling at the EU and global context produced for 5 sectors’), these interventions were further detailed and elaborated upon to identify actionable steps in the transformation processes. The refinement process involved performing a comprehensive analysis based on the data provided by case study leaders in Deliverable 3.2. This analysis entailed breaking down the overarching intervention into more specific components (for example, the intervention focused on school gardens in Hungary's education sector was refined -based on the data provided by case study leaders- into integrating experiential learning into the curriculum, enhancing teacher training and support, and expanding access to nature). The case study leaders were then reached out to for validation of these refined components, ensuring accuracy and alignment with the original data. This iterative approach allowed for a more nuanced understanding and strategic planning to effectively address the objectives and unique challenges within each sector.

Creation and Validation of Pathways

This section elucidates the roles of both the CzechGlobe research team and the case studies in the creation and validation of the transformative pathways. In the creation of transformative pathways, the CzechGlobe research team guided the extensive sector-based case studies through structured methodologies that emphasised collaborative engagement and participatory approaches. Each case study was tasked with organising workshops to identify leverage points that could facilitate significant change within their respective contexts. Concurrently, the CzechGlobe research team analysed and synthesised the findings from these workshops, identifying common themes and contextualising the results within broader EU and global sustainability frameworks. This foundational data served as a critical reference point for envisioning how these initiatives could be effectively scaled up to both the EU and global contexts. The analysis was further enriched by examining barriers and opportunities for broader change, as well as identifying the potential broader impacts on other sectors. Once the initial pathways were developed by the CzechGlobe team, they collaborated with the case study leaders to validate these pathways through further discussions and consultations. This validation process yielded additional insights that informed refinements, ultimately enhancing the pathways to ensure they were both actionable and contextually relevant. This collaborative process resulted in the development of detailed and actionable transformative pathways tailored to each sector - agriculture, trade, finance, education, and fashion - aimed at enhancing biodiversity outcomes and promoting sustainable practices across the EU and beyond.

3 Description of extensive sector-based cases

Patricia Ofori-Amanfo

This subchapter briefly describes each of the six extensive sector-based cases in the PLANET4B project, main aims and key stakeholders identified by the case study leads and respective advisory boards as driving transformative change in the various sectors-agriculture, finance, trade, education and fashion.

3.1 Enhancing agro-biodiversity through local seed networks (Hungary-ESSRG)

An analysis of literature on the link between gender and agrobiodiversity -conducted by the case study- reveals the existence of gender division of labour in all societies. The management of seeds (seed selection, seed saving, seed cleaning and seed storage) is frequently done by women. However, research programmes about plant genetic resources (PGRs) often place emphasis on crop production and market-oriented crops. Thus, the "reproductive" side of farm households and gardening is under researched - including crops grown for home consumption as well as foraging. Although these are intrinsic aspects of small – scale and subsistence farming, they are often glossed over.

This case aims to raise awareness about the diversity of seeds by examining the connection between gender and these reproductive tasks (including seed saving and management of agrobiodiversity) to support a better understanding of the values connected to seed saving. Also, it addresses the national and EU seed legislations, biodiversity strategy, and the Common Agricultural Policy (CAP). Again, it aims to map the seeds system dynamics in Hungary, specifically the informal seed system actors.

Main aim of transformative change: the transformative change in this case study seeks to support and enhance biodiversity by shifting away from centralised, commercialised seed systems towards a decentralised network of local seed hubs.

Key stakeholders driving change in the case study sector:

NGOs and community organisations: Magház Association: As a key player in organising seed networks and hubs, this organisation facilitates grassroots movements for seed saving and sustainable agriculture.
Farmers and gardeners: Hobby Gardeners and Small-scale Farmers: These individuals are pivotal in conserving and experimenting with diverse seed varieties. They serve as custodians of agrobiodiversity through direct practice and seed exchange.
Market gardeners: Community Supported Agriculture (CSA) Farmers: These farmers participate in alternative food networks and promote ecological farming practices that integrate diverse seed varieties.

Institutions and state actors: Hungarian National Gene Bank (NBGK): This institution plays a critical role in preserving genetic diversity and distributing seeds to farmers, facilitating on-farm conservation efforts. Regulatory Bodies: Entities that control seed certification and registration processes can influence which varieties are available and promoted.
Research and academic institutions: Universities and Research Bodies conducting research on sustainable seed systems: These institutions are involved in conducting participatory research projects that test and adapt local seed varieties.
Consumers and local communities: Short Supply Chain Consumers: These consumers drive demand for locally grown, diverse vegetables, encouraging market gardeners and CSA farmers to maintain agrobiodiversity.
Chefs and the catering industry: Chefs with Interest in Sustainability: By sourcing unique and diverse vegetable varieties, chefs can help create a market demand that supports local seed variety cultivation.

3.2 Case Study: Trade and Global Value Chains between Brazil and the Netherlands (RU)

This case investigates the consequences and limits of new public EU regulations on sustainable supply chains, such as the EU Deforestation Regulation (EUDR) and the Corporate Sustainability Due Diligence Directive (CSDDD), to socio-biodiversity loss linked to international commodity trade of soy and beef between Brazil and the Netherlands. Through this investigation the case aims to curb deforestation in the Brazilian Amazon and Cerrado. Also, it aims to cause a mind-shift in extensive livestock farming and industrialised soy production, raising awareness about alternative modes of production and consumption, resulting in changes in international trade patterns to better support biodiversity and people. Again, the case seeks to achieve an improvement in the implementation of regulations such as the EUDR as regarding the prioritisation of biodiversity and people.

Main aim of transformative change: to enhance biodiversity conservation and socio-environmental justice by critically assessing the impacts of EU regulations, such as the EU Deforestation Regulation and the Corporate Sustainability Due Diligence Directive, on the international trade of soy and beef between Brazil and the Netherlands, while addressing the associated challenges and opportunities within global value chains.

Key stakeholders driving change in the case study sector:

Local communities: Indigenous and Afro-descendant communities in the Brazilian Amazon and Cerrado negatively impacted by agribusiness expansion in regions like Santarém, PA; Mojui dos Campos, PA; and Luís Eduardo Magalhães, BA.
Academia: Researchers and students from multiple universities in the Netherlands and Brazil investigating the ecological and social repercussions of trade: Radboud University (Netherlands), Wageningen University (Netherlands), Universidade Federal

do Pará (UFPA, Brazil), Universidade de Brasília (UnB, Brazil), Instituto Nacional de Pesquisas da Amazônia (INPA, Brazil).
Environmental NGOs: Organisations advocating for sustainable practices and environmental justice: Federation of Organs for Social and Educational Assistance (FASE), Instituto Socioambiental (ISA), WWF-Brazil, and Instituto Clima e Sociedade.
Agroecological farmers: Producers in both Brazil and the Netherlands aiming to transition from conventional to agroecological farming systems.
Government entities: Policymakers in Brazil and the EU responsible for implementing and regulating trade agreements and environmental policies: Brazilian federal agencies: Companhia Nacional de Abastecimento (CONAB), Ministério da Agricultura, Pecuária e Abastecimento (MAPA), Ministério do Meio Ambiente (MMA), Ministry of Indigenous Peoples and state-level agencies in the Cerrado and Amazon biomes. EU policymakers responsible for implementing the EUDR and CSDDD.
Financial institutions: Banks and investors influencing agricultural practices through funding and financial support.
Corporate actors: Companies involved in the soy and beef supply chain, including traders (specifically mentioning Bunge and Cargill), processors, retailers, and soy and beef associations in Brazil and the Netherlands.

3.3 Case study: "From Ego-System to Eco-System" in the Fashion Industry in Italy (UNIPI)

The textile, apparel and fashion (TAF) industries contribute significantly to global biodiversity loss and undermine people, climate and our planet through various processes across their supply chain (including production, processing, consumption, and product end life). Reducing the negative impacts of the operations of TAF industries on biodiversity would require a fundamental change in their business model, behaviour and the relationships among producers, workers, consumers and the environment. In this context, the case study aims to understand the connection between biodiversity and the fashion system while exploring pathways to transform the fashion industry. This case study explores the Tuscan fashion system, including networks of critical and alternative consumption, work, and production. It also offers support to social actors, companies, and public institutions to deliberate and discover transformative change as a means to integrate (prioritise) biodiversity protection within socio-economic activities.

Main aim of transformative change: to integrate and prioritise biodiversity protection within the Tuscan fashion system by fostering collaborative discussions among social actors, companies, and public institutions to redesign products and transform eco-social relationships with the environment, thereby addressing the negative impacts of the fashion industry on biodiversity and establishing sustainable practices.

Key stakeholders driving change in the case study sector:

Producers: luxury and fashion corporations, smaller sustainable producers.
Certification and standard-setting bodies: these bodies influence production practices through standards and labels like GOTS and OEKO-TEX. Their role is complex; while pushing for improvements, they might not always adequately address biodiversity concerns or the broader socio-economic aspects of the value chain.
Policymakers: government entities responsible for implementing and overseeing policies related to the fashion industry.
Consumers: individuals and associations advocating for sustainable purchasing behaviours (e.g. Fashion Revolution).
Civil Society: NGOs (Greenpeace and WWF) and movements focused on ethical practices and environmental protection.
Workers: labour unions advocating for fair treatment and working conditions.

3.4 Case study: Experiential learning and nature relatedness in Hungarian public schools (ESSRG)

Against the backdrop of increasing sustainability focused youth movements, this case explores the role of the education system in heightening awareness and empowering the youth to raise their voice and be proactive in seeking a better future. This case maps the institutional landscape and analyses why there appears to be a (lack of) emphasis on the environmental crisis in high schools, and how far individual scientific subjects (either as curricula, or offered as extracurricular activities) could help raise awareness on biodiversity. Using action research, it seeks to tackle the following questions: a) why is it important for children at different ages to have biodiversity education? b) can it influence a transformative change? c) can the whole public education system introduce biodiversity education in a more integrated manner, not in siloes? In the context of a strong political dimension this case will also examine: a) is transformative change even attainable in a scenario of strong centralisation and power asymmetry?

Main aim of transformative change: enhance environmental awareness and foster a deeper connection between youth and biodiversity through the integration of experiential learning in the Hungarian education system, while addressing the current shortcomings in biodiversity education and promoting a holistic understanding of ecological issues.

Key stakeholders driving change in the case study sector:

Students: direct beneficiaries of enhanced nature relatedness through experiential learning.
Teachers: key actors in implementing experiential learning methods and fostering a connection to nature.
School principals/administrators: responsible for resource allocation, curriculum development, and creating a supportive school environment.

Ministry of education/policymakers: influence curriculum, teacher training, resource allocation, and overall educational policy: State Secretariat for Public Education (Ministry of Interior)
Environmental NGOs: support experiential learning initiatives, provide resources, and advocate for policy changes: Blue Planet Foundation
Parents/community: influence students' values and attitudes toward nature and contribute to the broader societal context.
Researchers/academics: contribute to understanding the impacts of experiential learning and inform policy development: Environmental Social Science Research Group (ESSRG)

3.5 Case study: Sustainable investment behaviour in the financial sector (Global-EU-Norway - NINA)

The EU Directive on non- Financial Disclosure requires business ESG (Environmental, Social Responsibility, Governance) reporting on nature risks. Notwithstanding, ESG indicators and the natural capital accounting upon which they build is not robust. Moreover, investor decisions are influenced by various cognitive biases. This case is currently conducting a systematic literature review to assess evidence that investor cognitive biases are magnified in the context of ESG uncertainty. Following from this, NINA (Norwegian Institute for Nature Research) together with identified financial stakeholders, will investigate the implications for ESG indicator design, and more broadly as sustainable finance as a leverage point for the transition to a green economy.

Main aim of transformative change: to enhance the robustness of ESG reporting and address cognitive biases among investors in order to promote sustainable investment behaviour and effectively support the transition to a green economy

Key stakeholders driving change in the case study sector:

Financial institutions: banks, asset managers, and investment funds responsible for allocating capital and managing investments.
Regulatory bodies: European and international agencies overseeing sustainability reporting, specifically focusing on the European Sustainability Reporting Standards (ESRS) E4, which pertain to biodiversity and ecosystem considerations, and financial regulations.
Academia: researchers such as those from the Norwegian Institute for Nature Research (NINA) studying the relationship between finance and biodiversity, providing insights into metrics and compliance.
NGOs: organizations advocating for biodiversity protection and sustainable finance practices.
Private Sector Companies: firms seeking to align their business models with environmental sustainability and compliance directives.

3.6 Case Study: Agriculture and Migration in the EU (FiBL)

Labour plays a central role in agriculture with labour availability informing farming decisions and the way farmers operate their farms. Additionally, migrant labour requirements are affected by the demographic and structural changes in European agricultural landscapes. Coupled with this, unsustainable farm management practices decrease habitat quality and affect biodiversity negatively.

Currently, there is paucity of knowledge about the relationship between labour availability and biodiversity conservation in agricultural landscapes, and also on the relationship between migrant labour and biodiversity conservation.

Against this background, this case examines how migrant labour influences farming systems in host and home countries, especially relating to biodiversity-friendly practices on farms and within landscapes. This case seeks to answer the following questions in host and home countries: a) how does (migrant) labour availability influence farmers' decision-making? b) how does labour migration influence farms and agricultural landscapes in relation to biodiversity? c) how is biodiversity vulnerable on farms and agricultural landscapes, to changes in labour and migration policy?

It is expected that findings from this study will provide stakeholders and policymakers across the EU with an evidence base and recommended strategies on how to reconcile ecological ambitions in the agricultural sector and demographic changes within the EU.

Main aim of transformative change: to improve the interplay between labour availability and biodiversity conservation within EU agricultural systems by examining the impacts of migrant labour on farming decisions and practices, and subsequently advocating for policies that support both ecological integrity and fair labour conditions

Key stakeholders driving change in the case study sector:

Farmers: directly impacted by labour shortages and the effectiveness of Common Agricultural (CAP) policies.
Migrant workers: fill labour demands, but face vulnerabilities and potential exploitation.
EU policymakers: responsible for CAP legislation, including subsidies and regulations impacting farming practices (members of European parliament)
Environmental NGOs: advocate for biodiversity-friendly agriculture and improved working conditions.
Consumers: demand for affordable food influences policy and farming practices.

4 Results

4.1 Transformative pathways for systems change in agriculture sector (with a focus on enhancing agrobiodiversity through seed bank network)

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Introduction

The agrobiodiversity case study revealed the significance of the self-organising dynamics of the open pollinated vegetable seed system based on the bottom-up seed-related activities (e.g. on-farm experimenting, community seed exchanges, local and regional networking and organising, etc.) of small-scale farmers and market gardeners, amateur and hobby gardeners, civil society and other small-scale, local actors. These dynamics usually referred to as constituting an informal seed system, as opposed to the highly bureaucratised, state regulated, and commercialised formal seed system. The target groups of the transformation of the agrobiodiversity system are small-scale farmers, family farms, market gardeners, small-scale breeding and seed companies, participatory researchers, local community actors organising seed exchanges and seed hubs. Big agribusiness actors (large-scale farmers, big commercial seed multinational companies, etc. – powerful actors in the formal seed system) are only considered here as ones from whom the informal seed system should be protected in order to keep the creative, socially innovative, and evolutionary potential and the self-organising dynamics of informal seed system.

The following section explores the barriers and opportunities (identified by the case) for transformative change within the agricultural sector with a focus on enhancing agrobiodiversity through seed bank network, followed by a discussion of the pathways at both the EU and global levels. The pathways are based on the data and insights from the case study, particularly focusing on barriers and opportunities for driving change within the agrobiodiversity system, leverage points, desired intervention, potential broader impact and key stakeholders. This case study chose to employ the original twelve-point Meadows leverage point framework for a more detailed analysis. These pathways (at both the EU level and global level) demonstrate a logical progression of actions, illustrating how each step builds on the previous ones to achieve transformative outcomes for enhancing agrobiodiversity through local seed networks.

EU-level pathway is focused on designing a legal and policy environment that allows for the context-sensitive, bottom-up self-organising dynamics of the informal seed system. Currently, the legal and policy environment in many EU Member States presents significant challenges for community seed networks. For example, stringent

seed regulations require that seeds for commercial sale be listed in official national seed catalogues, which limits the ability of farmers and gardeners to exchange non-registered or diverse varieties (European Commission, 2021) Many existing seed laws and policies tend to prioritise the rights and interests of large agribusiness over those of small-scale farmers and gardeners. This can constrain their rights regarding seed-related activities, including seed-saving, breeding, and maintenance of open-pollinated varieties, seed exchange, and selling seeds to other small-scale farmers and gardeners. By addressing these critical rights within the policy framework, we can help remove barriers that currently hinder small-scale agricultural practices. This transformative policy approach not only supports the resilience of local seed systems but also enhances agrobiodiversity by empowering farmers to maintain and share diverse varieties. Within the EU, fostering regional cooperation and networking among community seed hubs, financial support for small-scale local farmers engaged in on-farm agrobiodiversity conservation, and increased consumer awareness of the primary significance of seed as a cultural heritage are all encouraged and widely communicated.

Table 2. Transformative pathways (EU level, global level) for systems change in agriculture sector (with a focus on enhancing agrobiodiversity through seed bank network).

Goal of the EU transformative pathway	
To create an enabling environment of a decentralised and resilient seed network for agrobiodiversity throughout all EU Member States, while ensuring that gender equality and the voices of marginalised communities are integral to decision-making processes.	
Intervention identified by the case study	
To support the establishment of regional seed hubs that prioritise inclusivity, empowering local communities, particularly women, and ensuring their active participation in agrobiodiversity initiatives. The primary intervention involves supporting the establishment of regional seed hubs. However, this is not the only intervention; several additional aspects are crucial for enhancing agrobiodiversity. These include policy advocacy, financial support, educational initiatives, community engagement, knowledge sharing platforms.	
Desired change as a result of the intervention	
• Increased local and regional collaboration on the dynamic management of agrobiodiversity is to be fostered. • Enhanced exchange of knowledge and resources among small-scale farmers, seed growers and breeders are to be promoted. • Greater community involvement in agrobiodiversity initiatives is to be encouraged.	
Action steps to realise the intervention	**Targeted leverage point**
1. Create a supportive legal environment	**LP5 Rules of the system**
While the legal and policy context of open-pollinated vegetable seeds is quite enabling in many aspects in Hungary, this is not the case in all EU Member States. Some Member States have a supportive approach towards diverse seeds and community seed networks, however, there are some Member States where the exchange of diverse seeds is strictly limited or even prohibited. Some examples of countries with strict regulations regarding the exchange of diverse seeds include Germany, France, and Italy (European Commission, 2021; Pieri et al., 2020). In these countries, seed laws often require that seeds for commercial sale must be listed in official national seed catalogues, which limits the ability of community seed networks to exchange non-registered or	

diverse varieties. This regulatory framework prioritises commercial hybrid varieties and can inhibit efforts to promote agrobiodiversity.
To enhance the conservation of agrobiodiversity across the European Union, it is essential to create a legal and policy environment that enables the development of diverse seed movements and networks. The new EU Seed Law and the new NGT law (New Genomic Techniques law) – both currently under negotiation – will have a huge impact on the future of European seed movements, seed sovereignty and the overall state of agrobiodiversity. In order to promote sustainable agriculture and the conservation of (agro)biodiversity, conservation work and small-scale actors have to be exempted from the regulation that is aimed at the commercial seed market and large-scale seed producers, while small-scale actors and (agro)biodiversity have to be protected from the interests of the highly industrialised large-scale actors of agriculture. Opinions and needs of existing European community seed networks are to be considered and respected when discussing the content and the wording of the new seed regulations mentioned above, particularly with regard to potential risks, such as stringent regulatory compliance, and the support they could provide, including legal recognition and access to funding. It is essential to include provisions that facilitate informal seed exchanges and protect traditional varieties while being aware of the likely opposition from large-scale industry actors to such supportive measures.

2. Acknowledgement of community seed networks	**LP4 The power to add, change, evolve, or self-organize system structure.**

Formal recognition of community seed networks by governmental authorities, agricultural organisations, and relevant policy-making bodies is essential for integrating them into the broader agricultural system. This acknowledgement moves towards a more inclusive agricultural framework that values the contributions of these networks to agrobiodiversity and local seed conservation. By acknowledging their role, community seed networks can gain a specific mandate to engage in policymaking, advocate for supportive regulations, and collaborate with formal seed systems. This change in status can elevate community seed hubs to key actors in the agricultural landscape, granting them access to legal protections and funding opportunities that facilitate their operations and promote the conservation of local genetic diversity. In addition to the national public seed banks, EU encourages member states to enable the self-organising dynamics of the seed related activities of smaller scale local and regional actors flourish. Seeds connect the people with each other and demonstrate the inseparability of nature and culture.

3. Facilitate information exchange	**LP6 The structure of information flows**

Local knowledge hubs across Europe is to be supported to facilitate information exchange across regional and local community seed hubs. If supported, the network will maintain their own databases on seed varieties, best practices, and farmers' experiences, enhancing collaboration, learning and seed exchange. An online knowledge hub can be created that will allow for knowledge sharing, sharing of best practices in order to provide inspiration, motivation and learning for all interested in agrobiodiversity conservation. Objectives from the EU Farm to Fork Strategy are to be incorporated, emphasising grassroots, social innovation and knowledge transfer in sustainable agricultural practices to support localised, resilient food systems.

4. Fostering collaborative dynamics	**LP7 The gain around driving positive feedback loops.**

Regional programmes to develop quality seed varieties for hobby gardeners and small-scale market gardeners should be created to promote the collaboration between small-scale farmers engaged with on-farm agrobiodiversity conservation, researchers, small-scale breeding and seed companies. Shared initiatives and partnerships within and among regional community seed hubs need to be promoted to enhance agrobiodiversity practices, incorporating local narratives around solidarity and sustainability. The EU seed law and Common Agricultural Policy will have to be leveraged to promote funding for collaborative projects that drive engagement in on-farm agrobiodiversity conservation, related sustainable practices, addressing both agricultural and cultural shifts.

5. Enhancing material flows and biodiversity	**LP10 The structure of material stocks and flows** **LP11 The sizes of buffers and other stabilizing stocks, relative to their flows.**
Providing support for gene banks to develop their high-tech infrastructure for ex-situ seed-saving and to cooperate with community seed banks in implementing in-situ (on-farm) seed-saving as well as maintenance of heirloom varieties adapted to local and regional contexts is essential for agro(biodiversity) conservation. This support could be through funding and technical assistance for professional exchange among national gene banks. Funding for small-scale, locally and regionally based breeding and seed marketing enterprises is encouraged. Policies that incentivise farmers to grow diverse, local seed varieties, as well as small grants to support site visits, seed exchange and sharing of best practices among community seed hubs across countries, are to be implemented. These practices are to be ensured in line with commitments under the EU Biodiversity Strategy for 2030, which seeks to increase organic farming and high-biodiversity features in agricultural areas.	
6. Redefining agricultural goals	**LP3 The goals of the system** **LP2 The mindset or paradigm out of which the system — its goals, structure, rules, delays, parameters — arises**
The informal seed system of open pollinated vegetable varieties embodies a different institutional logic and paradigm as opposed to the currently mainstream agricultural paradigm. Transformation includes a shift from a growth-oriented, yield and efficiency maximising, industrial-business mindset that instrumentalises nature and all non-human beings to a reciprocal care-based approach that cooperates and dwell together with all non-human beings in resilient and sustainable landscapes. Agricultural policies and subsidies are to be reconfigured in order not to limit the self-organising dynamics and autonomy of the informal seed system. Policy goals are revised in a way that places emphasis on the protection of cultural heritage through local seed varieties. The paradigm shift in agriculture will prioritise resilience, cultural heritage, and smaller scale sustainable practices over mere productivity and large-scale operations. This is to be aligned with the EU Common Agricultural Policy reforms that emphasise environmental sustainability and social equity, shifting focus toward quality food production and care-centred approaches.	
Key stakeholders important for the realisation of the intervention	
Government bodies: EU agricultural, biodiversity, education and culture-relevant policymakers and regional governments: European Commission's Directorate-General for Agriculture and Rural Development, European Environmental Agency, ministries of agriculture or environment in EU member states are involved. **Private sector:** Breeding and seed companies (primarily smaller scale, family enterprises), small-scale farmers and market gardeners, and agricultural cooperatives are involved. **Civil society:** CSOs and NGOs focused on agrobiodiversity (WWF, the Magház Association), community seed networks, local farmer organisations, and community groups play significant roles.	
Potential broader impact	
Other regions and countries should be encouraged to have their own dynamics, while creating or strengthening an enabling legal and policy environment. This is expected to contribute to greater genetic diversity in vegetable varieties globally and foster community-based sustainable agriculture. By influencing policies and promoting paradigmatic shifts, agrobiodiversity conservation can be integrated into national and EU-level agricultural policies, leading to systemic changes that prioritise biodiversity and resilience in agriculture. Furthermore, policies that support the documentation and protection of traditional knowledge related to local seeds are to be encouraged.	

Goal of the global transformative pathway

To create an enabling global environment for community seed banks to enhance agrobiodiversity and sustainability. The global pathway aims to promote sustainable seed practices and enhance biodiversity globally while ensuring that marginalised voices, particularly those of local communities and women, are heard and empowered in the agricultural narrative.

Intervention identified by the case study

Raising awareness and subsequent implementation of international legal frameworks on open-pollinated vegetable seeds by regional policymakers when working on new policies connected to agriculture

Desired change as a result of the transformative pathway

- Enhanced access to knowledge on seed sovereignty globally is to be achieved.
- Improved communication and collaboration among international stakeholders (except those who follow the industrial-agribusiness paradigm in the agricultural sector) regarding biodiversity practices are to be established.
- A higher rate of species and variety conservation and genetic diversity in agriculture is expected.

Action steps	Targeted leverage point
1. Create A Supportive Legal Environment	**LP5 The rules of the System**

While the legal and policy context of open-pollinated vegetable seeds is quite enabling in many aspects in Hungary, unfortunately this cannot be said in a global context. There are several international legal frameworks that are supposed to ensure the right to seeds: the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) aims at guaranteeing food security through the conservation, exchange and sustainable use of the world's plant genetic resources for food and agriculture (PGRFA), the fair and equitable benefit sharing arising from its use, as well as the recognition of farmers' rights; the Nagoya Protocol focuses on the fair and equitable sharing of benefits arising from the utilisation of genetic resources and traditional knowledge; while the UN Declaration on the Rights of Peasants and Other People Working in Rural Areas (UNDROP) declares a series of rights for peasants, including the right to seeds. While the international legal frameworks seem promising, in practice they are many times neglected when constituting regional or local policies – peasants and local communities have to fight for their right to save, use and sell their own seeds all over the planet. The baseline for the conservation of agrobiodiversity is to make sure that these legal frameworks are known, respected and taken into account by policy makers when working on new policies connected to agriculture (specifically seeds) or environmental issues.

2. Acknowledgment of Community Seed Networks	**LP4 The power to add, change, evolve, or self-organize system structure.**

International frameworks that create the legal basis for the work of community seed networks (such as the Nagoya Protocol, the ITPGRFA and the UNDROP) are to be taken into account when creating new legal frameworks, respected and complied with. Collaboration with global and local organisations is to be supported to empower grassroot movements enabling farmers to organise autonomously. There are already many community seed networks working for the diversification of agriculture, the right to save seeds and the right of small-scale and subsistence farmers. Their voices should be heard when working on new legal frameworks, their work should be acknowledged and supported in order to enhance the conservation and development of agrobiodiversity. The Kunming-Montreal Global Biodiversity Framework is to be implemented by enhancing biodiversity and sustainability in agriculture through diversified seed bank systems, specifically fulfilling Target 10. Ensuring equitable access and benefit-sharing from genetic resources, while supporting local communities in the establishment and management of these seed banks, is mandated by the Nagoya Protocol. Additionally, efforts to transform the social narrative around agriculture as a vital connection between people and the environment should be prioritised.

3. Facilitating Information Exchange	**LP6 The structure of information flows**

Global research initiatives studying the impacts of community seed systems on agrobiodiversity are to be supported, with insights shared through international conferences and publications. A global, multilingual digital platform for sharing best practices (for community seed networks, small-scale breeding and seed companies, community supported agriculture initiatives and small-scale farmers) and knowledge should be established in order to provide inspiration, motivation and learning for all interested in agrobiodiversity conservation. Such a platform would also serve as an online meeting space for regional seed hubs, researchers, farmers, NGOs and policy makers. It is highly important to take steps against the misappropriation of information shared on such a platform. Collaborative efforts aimed at integrating diverse knowledge on seed practices and biodiversity are to be leveraged under the Kunming-Montreal Framework. The sharing of best practices is to be aligned with Sustainable Development Goals (SDGs) Target 2.5, which emphasises maintaining genetic diversity in cultivated plants while enhancing narratives that highlight the importance of agrobiodiversity.

4. Fostering Collaborative Dynamics	**LP7 The gain around driving positive feedback loops.**

Building connections, exchanging knowledge and experiences, and study tours between countries are to be promoted to build international networks and learning opportunities regarding sustainable agricultural practices and good examples of supportive legal environments. Collaboration between indigenous and local communities, small-scale breeding and seed companies, small-scale farmers and scientific institutions are to be supported, in the form of participatory research programmes. Empowering the community seed movements of different countries to meet and exchange knowledge and experiences with each other would be a key action for driving change. The active participation of Indigenous Peoples and Local Communities (IPLCs) in decision-making concerning genetic resources is to be ensured under the Nagoya Protocol, following equitable benefit-sharing principles. Alignment with Target 5.5 of SDG 5 is necessary to promote women's participation in agriculture and decision-making processes regarding seed management in local communities. Additionally, educational programmes that foster engagement with agrobiodiversity at all levels of society should be prioritised.

5. Enhancing Material Flows	**LP10 The structure of material stocks and flows** **LP11 The sizes of buffers and other stabilizing stocks, relative to their flows.**

Policies that enable the growing and saving of open-pollinated seeds, selling them by local farmers, community supported agriculture initiatives, hobby gardeners and other small actors as well as exchanging them are to be promoted. Commercial seeds on the seed market must comply with a high number of international and national regulations but making it easier for diverse seeds to be sold or exchanged would affect the conservation and development of agrobiodiversity highly positively. The Kunming-Montreal Framework is to implement Target 23 by ensuring that actions aimed at enhancing biodiversity promote gender equality and inclusion in agricultural practices. Moreover, initiatives should recognise the intrinsic value of local communities in maintaining genetic diversity and support efforts to integrate these communities' knowledge into broader agricultural practices. SDG 2's Target 2.5 directly supports the maintenance of genetic diversity as a core element of sustainable agriculture

6. Redefining Agricultural Goals	**LP3 The Goals of The System** **LP2 The mindset or paradigm out of which the system — its goals, structure, rules, delays, parameters — arises.**

The informal seed system of open pollinated vegetable varieties embodies a different institutional logic and paradigm as opposed to the currently mainstream agricultural paradigm. Transformation includes a shift from a growth-oriented, yield and efficiency maximising, industrial-business mindset that instrumentalises nature and all non-human beings to a reciprocal care-based approach that cooperates and dwell together with all non-human beings in resilient and sustainable landscapes. Agricultural policies and subsidies are to be reconfigured in order not to limit the self-organising dynamics and autonomy of the informal seed system. Policy goals are revised in a way that places emphasis on the protection of cultural heritage through local seed varieties. The paradigm shift in

agriculture will prioritise resilience, cultural heritage, and smaller scale sustainable practices over mere productivity and large-scale operations.
The transformative changes prioritising biodiversity conservation and sustainable resource management should also highlight the role of local traditions and knowledge in contemporary agricultural practices. Sustainable production patterns, including public procurement policies favouring locally sourced, diverse agricultural products, are to be promoted under SDG 12.

Key stakeholders important for the realisation of the transformative pathway
Government bodies: National biodiversity and agriculture ministries, along with international organisations such as FAO and CBD, are included. **Private sector:** International seed companies that specialise in maintaining and developing open-pollinated varieties for small-scale farming and technology platforms for digital exchange that operate on a peer-to-peer, open access basis are recognised. **Civil society:** Global NGOs (WWF), indigenous rights organisations, universities and research centres (for example Wageningen University & Research in the Netherlands, University of Reading in the UK) that specialise in agriculture and biodiversity contribute valuable research, are identified.

Potential Broader Impact
Broader acceptance of sustainable agricultural practices on a global scale is anticipated. Enhanced seed and food security through diverse agricultural practices across countries is to be achieved. Integration of agroecological practices into national policies is expected to lead to cross-sectoral benefits (e.g., health, environment). The principles of the Nagoya Protocol are to be reinforced at national levels to ensure fair benefit-sharing.

Opportunities and barriers for realising the transformative pathway identified by the case studies	
Enabling factors	Disabling factors
Grassroots organisations: CSOs, NGOs and community groups advocating for seed-saving and sustainable agriculture play crucial roles in promoting and implementing on-the-ground initiatives. **Policy reform advocates:** policymakers and advocacy groups pushing for legislative and subsidy changes that support community seed networks, the dynamic management of agrobiodiversity and biodiversity are essential. **Educational institutions:** schools and universities integrating agrobiodiversity into their programmes and research agendas help build awareness and expertise. **Cultural shifts:** public interest in sustainability and local food systems enhances acceptance of paradigm shifts towards more ecological agricultural practices. **Promoting inclusivity:** Opportunities exist to uplift women's voices and those of other marginalised communities through targeted policy advocacy and community engagement. Promoting inclusivity in agricultural initiatives and ensuring representation in decision-making processes, the effectiveness and sustainability of agrobiodiversity efforts can be enhanced. **International cooperation:** global-level commitment from countries to meet biodiversity targets is anticipated, alongside advancements in technology.	**Large agribusinesses:** resistance from large agricultural corporations with vested interests in maintaining industrial farming practices and centralised seed systems is expected. **Academic institutions:** science and research that is socially and ethically non-reflective on their own practices and with existing commercial ties and contracts with big agribusinesses and with research grant aiming for high-tech solutions for agriculture **Conventional agricultural policies:** existing policies favouring large-scale efficiency and economic growth over biodiversity could slow legislative change and adaptation to new agricultural paradigms. **Economic constraints:** limited financial resources available for small-scale farmers or seed networks may impede growth and scaling of impactful initiatives. **Cultural resistance to change:** norms and beliefs rooted in high productivity and commercial agriculture may resist the shift towards diversified and small-scale practices. **Gender disparities:** in access to resources, decision-making, and participation are significant barriers that hinder the effective implementation of agrobiodiversity initiatives. Women and other marginalised groups often lack representation in agricultural decision-making bodies, limiting their

	ability to influence policies that affect their communities

4.2 Transformative pathways for system change in the agriculture and livestock trade and global value chains

Blanka Loučková, Elif Tugba Simsek, Patricia Ofori-Amanfo, Vinícius Mendes, Cristina Y. A. Inoue

The upcoming section explores the barriers and opportunities for transformative change to enhance biodiversity conservation in the soy and beef trade sector. The pathways are informed by data and insights from the case study, with a specific emphasis on identifying barriers and opportunities for change within the soy and beef trade between Brazil and the Netherlands, as well as leverage points, strategic interventions, potential wider impacts, and key stakeholders. This case study chose to employ the original twelve-point Meadows leverage point framework for a more detailed analysis. They illustrate a logical progression of actions at both the EU and global scales, showing how each step builds upon the previous to achieve transformative change in trade and global value chains.

Table 3. Transformative pathways (EU level, global level) for system change in the agriculture and livestock trade and global value chains.

Goal of the EU transformative pathway	
Establishment of sustainable and equitable trade practices that enhance biodiversity conservation in the soy and beef supply chains.	
Intervention identified by the case study	
Public sharing of commodity origination Reform of the EU's Common Agricultural Policy to support agroecological practices and small-scale farming, thus addressing the existing policy barriers that hinder small-scale farmers' ability to contribute effectively to biodiversity conservation.	
Desired change as a result of the intervention	
• Implementation of regulations requiring companies to disclose sourcing information for soy and beef products, ensuring accountability in supply chains • Transitioning agricultural policies to prioritise agroecology and support for small-scale farmers, promoting sustainable agricultural methods that protect biodiversity • Inclusion of biodiversity protection provisions in EU trade agreements, aligning economic practices with environmental sustainability goals	
Action steps to realise the intervention	**Targeted leverage point**
1. Supporting the reform of the Common Agricultural Policy	**LP3 Goals of the system**
Comprehensive reforms of the CAP are to be supported to prioritise agroecological practices, providing funding and incentives for small-scale farmers transitioning to sustainable production methods, thus creating the conditions for subsequent steps. Incorporation of principles from the **EU Biodiversity Strategy for 2030** is to be ensured, focusing on enabling transformative change and promoting sustainable food systems. Additionally, integrating community-based agriculture and food sovereignty principles can further enhance the resilience of local food systems while reducing reliance on industrialised monocultures.	

2. Supporting the financial mechanisms for agroecological transitions	**LP10 The structure of material stocks and flows**
Funding programmes targeting smallholder farmers are to be developed that facilitate the adoption of sustainable agricultural practices, including agroecological solutions. This includes two separate sources of funding: public subsidies from EU policy financial programmes and private funding from partnerships with local banks and microfinance institutions. Alignment of funding opportunities with the **EU Regulation on Deforestation-free Products** is to be ensured, directing investments toward deforestation-free initiatives. In this step, initiating partnerships with local banks and microfinance institutions could enhance access to financial resources for smallholder farmers.	
3. Implementation of transparent sourcing regulations	**LP4 The power to add, change, evolve, or self-organize system structure.**
Regulations are to be advocated for that require companies to publicly share sourcing polygons and data related to soy and beef production, ensuring transparency in supply chains. Alignment with the **EU Regulation on Deforestation-free Products (2023) (**already in force since 29 June 2023. Following the targeted amendment, its rules will start to apply on 30 December 2025) is to be ensured, mandating companies to guarantee that supply chains are not linked to deforestation and requiring firm transparency in sourcing. Promoting technology-driven solutions, such as blockchain for supply chain transparency, could bolster compliance and enhance consumer trust.	
4. Increasing of public awareness and engagement	**LP6 The structure of information flows**
Campaigns are to be launched to raise awareness about the impacts of soy and beef production on biodiversity, encouraging consumer activism and participation in advocacy efforts. Support is to be provided for initiatives under the **Corporate Sustainability Due Diligence Directive (2024)** that obligate companies to address adverse impacts and enhance their engagement with consumers regarding sustainability and human rights. Incorporating educational programmes in schools and communities about sustainable consumption and biodiversity's importance can foster a more environmentally conscious society.	
5. Engagement in international trade relations	**LP11 The size of buffers stocks, relative to their flows**
Dialogues between EU policymakers and Brazilian counterparts are to be fostered to ensure that trade agreements support biodiversity goals, integrating sustainability and human rights into economic partnerships. Compliance with provisions in the **EU Biodiversity Strategy for 2030,** specifically Action 1 (Establishing a new EU forest strategy) and Action 2 (Restoring and conserving ecosystems) is to be ensured. This includes advocating for the mainstreaming of biodiversity into trade agreements by promoting commitments to halt and reverse biodiversity loss, ensuring that any trade agreement reflects these biodiversity-friendly actions and supports the integration of sustainable practices within agricultural and trade policies.	
Key stakeholders important for the realisation of the intervention	
European Consumer Organisation (BEUC): represents consumer interests across Europe, advocating for transparency and ethical sourcing in products available in the EU market. **Environmental NGOs:** • **European Coalition for Corporate Justice (ECCJ):** Focuses on integrating corporate accountability and sustainability into EU policies, lobbying for responsible business practices within the EU • **ClientEarth:** An environmental law charity working with various stakeholders to promote sustainable practices and ensure EU policies effectively address environmental challenges. **Government Entities:**	

- **European Commission Directorate-General for Environment (DG ENV):** Develops and implements environmental policies such as the EUDR and CSDDD.
- **European Commission Directorate-General for Trade (DG TRADE):** Engages in the development of trade agreements that incorporate sustainability regulations.
- **European Parliament Committees (e.g., Committee on Environment, Public Health and Food Safety - ENVI):** Plays a key role in the legislative process concerning trade and sustainability regulations.

Potential broader impact
Enhanced livelihoods for marginalised communities in Europe resulting from more equitable trade practices is expected. Increased consumer demand for sustainable products influencing agricultural practices and policymaking in the EU is to be achieved. Biodiversity preservation through reduced deforestation and more sustainable agricultural practices is anticipated.
Expected outcomes
Short-term: increased transparency in EU trade practices, leading to greater accountability among European corporations sourcing soy and beef **Medium-term:** adoption of sustainable production standards by EU companies, resulting in reduced biodiversity loss and deforestation linked to supply chains **Long-term:** a significant shift in European agricultural policies to prioritise sustainability and social equity within trade agreements

Goal of the global transformative pathway	
Establishment of a global coalition aimed at advancing sustainable trade practices that protect biodiversity and promote social-environmental justice. This coalition will focus on transforming the systemic practices in the soy and beef supply chains by fostering collaboration among stakeholders, sharing knowledge, and advocating for policies that support sustainable production and equitable trade. By addressing the root causes of unsustainable practices, the coalition aims to create a framework for change that benefits both people and the planet.	
Intervention identified by the case study	
Establish international standards for sustainable production (the absence of consistent and enforceable international standards for sustainable beef and soy production serves as a significant hindering factor, leading to practices that jeopardise biodiversity and exacerbate social inequalities). Promote data-sharing mechanisms regarding the environmental impacts of agribusiness.	
Desired change as a result of the transformative pathway	
• Development and enforcement of global standards for sustainable soy and beef production, promoting eco-friendly practices worldwide • Creation of platforms for transparent sharing of environmental impact data among countries, fostering accountability and informed decision-making • Strengthening of global advocacy networks: mobilisation of NGOs and community organisations to advocate for sustainable trade practices and environmental justice on a global scale	
Action steps	**Targeted leverage point**
1. International Standards for Sustainable Production to be Established	**LP4 The power to add, change or self-organise system structure**
Collaboration with international organisations is to take place to create and enforce standards for sustainable soybean and beef production, ensuring these products are environmentally responsible. Alignment with the Kunming-Montreal Global Biodiversity Framework is to be ensured, emphasising the fostering of equitable practices and the integration of sustainability into global trade policies. Incorporating stakeholder consultations from local communities in the standard-setting process can enhance ownership and adherence to these standards.	

2. Data-Sharing Mechanisms to be Promoted	LP6 The structure of information flows
Global data-sharing initiatives are to be implemented that provide insights into the environmental impacts of agribusiness, fostering accountability and transparency across borders. Support for the **Cartagena Protocol on Biosafety (2000)** is to be integrated by sharing genetic modification impact data related to soy trade, ensuring informed decision-making. Expanding data-sharing platforms to include socio-economic impacts and indigenous knowledge can provide a more holistic understanding of agribusiness effects.	
3. Global Advocacy Networks to be Mobilised	**LP7 The gain around driving positive feedback loops**
NGOs and community organisations worldwide are to leverage their collective power to advocate for equitable trade practices and ecological protection, creating a united front against harmful trade agreements. Insights from the **International Labour Organisation's (ILO) conventions** are to be used in advocacy for labour rights and against environmental racism in agribusiness.	
4. **Cross-Border Partnerships for Agroecological Practices to be Built**	**LP10 The structure of material stocks and flows**
Partnerships across nations are to be developed to support agroecological initiatives, sharing knowledge and resources to empower local communities in sustainable practices.	
Key stakeholders important for the realisation of the transformative pathway	
Local communities: indigenous and marginalised groups in Brazil and other soy-producing countries advocating for their rights and sustainable practices. Their engagement is vital for ensuring that local knowledge and needs are considered in policy development and implementation, particularly regarding seed sovereignty and biodiversity conservation. **International NGOs:** global organisations working towards sustainability, equity, and social justice within trade frameworks: • **WWF (World Wildlife Fund)**: actively works towards sustainability, equity, and social justice within trade frameworks, advocating for biodiversity conservation and responsible sourcing in agricultural practices. • **Friends of the Earth**: engages in campaigns to raise awareness of environmental impacts and advocate for just trade practices that benefit both nature and local communities. • **Oxfam**: focuses on fighting poverty and inequality, conducting research and advocacy work that promotes fair trade and sustainable agriculture. **Corporations:** multinational companies involved in agribusiness, impacting trade practices and standards on a global scale: companies such as Cargill and Bunge are deeply involved in soy and beef production and trade, significantly influencing global supply chains and agricultural practices. Retailers: companies operating in the retail space, such as Tesco and Carrefour, play a significant role in shaping consumer demand for sustainably sourced products, impacting trade practices across their supply chains.	
Potential Broader Impact	
Increased consumer demand for sustainable products influencing agricultural practices and policymaking globally is expected. Global biodiversity preservation through reduced deforestation and more sustainable agricultural practices is to be achieved. Setting a precedent for sustainability standards that influence other regions and promote coordinated international policies is anticipated.	
Expected outcomes	
Short-term: heightened awareness of the global impacts of soy and beef trade on biodiversity among international stakeholders **Medium-term:** strengthened international norms and standards for sustainable production across countries involved in the soy and beef supply chains **Long-term:** transformation of global market dynamics where sustainability becomes a prerequisite for trade, influencing other regions to adopt similar practices	

Opportunities and barriers for realising the transformative pathway identified by the case studies	
Enabling factors	Disabling factors
More effective and inclusive stakeholder dialogues: Facilitating more effective and inclusive dialogues among all parties involved is important, going beyond traditional formal procedures. For example, producing a documentary film can serve as a practical tool to foster these dialogues. It enables genuine engagement and ensures that local communities are included in the conversation. **Rising consumer demand:** increasing consumer interest in sustainable and ethically produced goods can spur market changes **Policy advocacy:** ongoing advocacy for EU regulations that support sustainable agriculture can reinforce support for biodiversity initiatives. Sustainability standards that strengthen the focus on the social and human rights dimensions can also be considered enabler factors for broader change **International collaboration:** cross-border initiatives can foster shared knowledge, technical support, and resource mobilisation, amplifying the impact of sustainability efforts **Innovation in agriculture:** investment in sustainable agricultural research globally can empower farmers with techniques and practices that support eco-friendly production	**Resistance from agribusiness:** powerful agribusiness entities in Europe may resist changes that threaten profitability **Political factors:** restrictive policies related to small-scale farming that hinder biodiversity efforts: current agricultural policies within the EU often prioritise large-scale, industrial agriculture, which marginalises small-scale farmers. This lack of support creates significant barriers for smallholders attempting to adopt sustainable practices and contribute to biodiversity conservation. By not facilitating access to resources, funding, and training for small-scale farmers, existing policies can hinder the transition to agroecological practices **Political instability:** variations in governance and regulation in soy-producing countries can hinder effective reforms; shifting political landscapes in Europe may affect the implementation of progressive sustainability policies **Consumer awareness:** limited consumer awareness in the global markets regarding the impacts of soy and beef production on biodiversity may impede demand for sustainable products. For instance, the production and consumption of oil crops, including soybeans, which can be processed into soybean oil, is highly globalised. This means that if less soybeans are produced in Brazil and the demand for oil crops, in general, is not reduced globally, other countries will take over the production of soybeans or other oil crops. Beef production is also highly globalised, with Brazil as one of the leading producers (see FAO, 2023) Therefore, alternative production systems face many challenges in growing, and it is key that we reduce the consumption of vegetable oil products and create policies that enable environments to promote community-based agriculture and forest management for strong local economies and food sovereignty. **Lack of international standards for sustainable production:** the absence of consistent and enforceable international standards for beef and soy production creates significant challenges, allowing unsustainable practices to proliferate. Without these standards, there is insufficient accountability and transparency in supply chains, making it difficult to protect biodiversity and promote equitable trade practices.

	Labour rights issues: inadequate protection of labour rights in agribusiness can hinder efforts to promote sustainable practices, as workers may face exploitation, unsafe working conditions, and insufficient compensation. **Environmental racism:** the disproportionate impact of environmental degradation on marginalised communities, particularly indigenous peoples, represents a form of environmental racism that hinders sustainable agribusiness practices.

4. 3 Transformative pathways for system change in the fashion sector

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Introduction

The transformative pathways outline steps that can lead to significant change in the fashion industry, aiming to support biodiversity and promote sustainability both within the EU and globally. This shift requires a paradigm transformation from "ego" to "eco," which involves redefining the relationship between humans and nature from one of extraction to one of regeneration and care. It also entails a new understanding of value, a redistribution of power to promote justice and equality, and a move from prioritising growth and quantity to embracing sufficiency and quality. In practical terms, this approach envisions a fashion system that meets human needs while respecting planetary boundaries.

Achieving sustainability in the fashion sector to particularly prioritise biodiversity and meet human needs, involves several systemic changes and interventions. First, there is a need to improve understanding of the connections between the textile, apparel, and fashion sectors and biodiversity, and to mainstream this knowledge. Studies demonstrate that enhanced knowledge and capacity within the industry can lead to meaningful changes in practices (Puig et al., 2018). Initiatives to build capacity and raise consumer awareness are essential, as evidence suggests that increased consumer awareness can significantly drive demand for sustainable products, influencing brands to prioritise eco-friendly practices (Nielsen, 2015). Reducing production and consumption is critical, as is addressing issues related to marketing practices, such as greenwashing and false environmental claims. A transition from voluntary governance to legally binding regulations is necessary; research indicates that binding regulations drive more substantial compliance and promote sustainable practices within the fashion industry (Kassinis & Panayiotou, 2020). Transparency, traceability, and accountability in supply chains must be prioritised to enhance consumer awareness and trust. Collaboration within the fashion industry, both

vertically and horizontally, should be strengthened, leading to changes in business models that favour small and local enterprises. Promoting an agroecological and regenerative transition in agriculture and fibre production is key, which includes efforts to reduce deforestation and the use of agrochemicals. The industry should shift towards sustainable production materials by phasing out synthetic materials and plastics and reducing reliance on virgin materials. Encouraging circularity in textiles and apparel involves extending the use of products, promoting zero waste, and enhancing recycling efforts. Furthermore, improving working conditions and empowering workers and local communities are essential aspects of this transformation. This involves addressing current conditions, amplifying voices, and fostering empowerment, potentially through agreements and collaboration with civil society organisations. Finally, sustainable water and chemical use must be ensured throughout the industry to support these broader goals.

The following subchapters explore the barriers and opportunities for transformative change within the fashion sector, followed by a discussion of the pathways at both the EU and global levels. The pathways are based on the data and insights from the case study, particularly focusing on barriers and opportunities for driving change within the fashion sector, leverage points, desired intervention, potential broader impact and key stakeholders. The case study chose to employ the original twelve-point Meadows leverage point framework for a more detailed analysis. These pathways (at both the EU level and global level) demonstrate a logical progression of actions, illustrating how each step builds on the previous ones to achieve transformative outcomes for fashion industry.

Table 4. Transformative pathways for system change in the fashion sector.

Goal of the EU transformative pathway	
Mainstreaming biodiversity prioritisation within the textile apparel, and fashion sector through capacity building, regulations, strategies, and business models.	
Intervention identified by the case study	
• Developing and disseminating the understanding of the connection between the textile, apparel and fashion sector and biodiversity (LP 2 and 6). • Enhancing Supply Chain transparency, traceability and accountability (LP 6). • Shift from voluntary governance to legally binding regulations at different fronts (LP 4 and 5): Establishment of transparency in supply chains, regulatory frameworks mandating sustainable practices • Foster changes in fashion business models towards circularity, sufficiency, and regeneration (LP 3)	
Desired change as a result of the intervention	
• Enhanced transparency in fashion supply chains ensures accountability. • Shift towards agroecological practices and sustainable textile consumption. • Integration of biodiversity goals into trade agreements and policies.	
Action steps to realise the intervention	Targeted leverage point

1. Implementation of supply chain transparency regulations	LP6 The structure of information flows
Advocacy for comprehensive legislation requiring fashion companies to disclose detailed information about their supply chains, including sourcing locations, types of materials, and environmental impacts. It may also require companies to engage third-party certifiers to validate claims of sustainable sourcing, thereby increasing accountability. This aligns with the Corporate Sustainability Reporting Directive, which emphasises the importance of reporting on supply chains, social and environmental impacts, and corporate transparency. Integrating consumer feedback mechanisms into transparency regulations can further enhance accountability and drive demand for sustainable practices	
2. Enforcement of sustainability regulations	**LP2 The mindset or paradigm out of which the system — its goals, structure, rules, delays, parameters — arises**
Support of the establishment of strict environmental standards and regulations that obligate fashion companies to minimise their ecological footprint. These regulations might include limits on waste production, emissions standards from manufacturing facilities, and requirements for the use of sustainable materials. Stakeholder consultations could involve input from civil society, local communities, and industry representatives to ensure balanced policy-making. This aligns with the EU Circular Economy Plan (policy's initiative to encourage sustainable production and prevention of waste). Furthermore, establishing penalties for non-compliance can reinforce the importance of adherence to these regulations, creating a stronger incentive for sustainable practices.	
3. Encouragement of circular economy models	**LP10 The structure of material stocks and flows**
Launch of funding initiatives aimed at supporting businesses that implement circular economy practices, such as recycling and eco-design. Financial incentives might include grants for research and development in sustainable materials and technologies, tax relief for companies adopting sustainable practices, and investment in infrastructure for textile recycling. Workshops and training programmes could enhance awareness and capacities in circular economy approaches. Encouraging partnerships with innovation hubs and academic institutions for research on new sustainable materials can also elevate the transition to circularity in the fashion sector.	
4. Empowerment of community-led initiatives	**LP5 The rules of the system**
Establishing of programmes that provide resources, training, and technology support for local businesses committed to sustainability, particularly small and medium-sized enterprises. Collaborative platforms can facilitate knowledge sharing among local producers, while partnerships with educational institutions can foster innovation in sustainable practices. This empowerment can extend to consumers through educational campaigns on the benefits of supporting local, sustainable fashion products. Highlighting case studies of successful community-led fashion initiatives can inspire similar projects and foster a culture of sustainability within the fashion sector.	
Key stakeholders important for the realisation of the intervention	
Local Communities and Environmental NGOs: Advocates for transparency and ethical practices, such as Slow Fiber and WWF Italy.	

Government Entities: Involved in legislative frameworks and trade agreements such as those of the Ministry of Environment and Energy Security in Italy for sustainable development strategy.

Workers and organised worker unions: Concerns around working conditions and fair treatment, mainly, but not exclusively, in the Global South, such as Faircoop.

Expected outcomes
Short-term: Increased transparency in supply chains, leading to enhanced accountability among fashion corporations. **Medium-term:** Adoption of sustainable production standards, resulting in reduced biodiversity loss and environmental harm linked to fashion supply chains. **Long-term:** A significant shift in EU agricultural and fashion policies (specifically targeting the CAP, Green Claims Directive, EU Eco-label and international trade agreements) prioritising sustainability, biodiversity, and social equity

Goal of the global transformative pathway	
To foster a just transition that recognises telecoupled socio-ecological impacts, redistributes power and benefits through the supply chain, and reduces the material resource use of the global textile, apparel, and fashion sector in absolute terms.	
Intervention identified by the case study	
• Strengthening of international collaboration through intergovernmental platforms and cross-border multi-stakeholder networks. • Promotion of consumer awareness about global impacts, circularity and sufficiency. • Promotion of a material shift in fibre and apparel production through regulatory efforts and an agroecological transition. • Empowerment of textile and fashion workers and local communities through civil society networks and trade regulations. • Promotion of a reduction in the absolute levels of fashion production and consumption through policy implementation.	
Desired change as a result of the transformative pathway	
• Establishment of international sustainability standards for production and consumption. • Creation of platforms for global data-sharing on environmental impact. • Strengthening of global advocacy networks for equitable trade practices.	
Action steps	**Targeted leverage point**
1.Strengthening of international collaboration through intergovernmental platforms and cross-border multi-stakeholder networks	**LP4 The power to add, change, evolve, or self-organize system structure** **LP5 The rules of the system** **LP6 The structure of information flows**
Inter-governmental collaborations must be created to discuss coherent strategies and align policies at both the national and international levels. This means fostering agreements between countries to adopt similar legally binding regulations and standards for the global fashion supply chain, while also encouraging companies to align their internal policies across different countries. Additionally, international multi-stakeholder platforms need to be created, ideally including representatives from different sectors (e.g., fashion industry, CSOs, governments, researchers, workers' and consumer	

organisations) to embrace multiple perspectives and improve cultural and contextual adaptation. These spaces can serve to disseminate knowledge about fashion and biodiversity, build capacities, share data, discuss interventions, develop standards, etc. Until now, these spaces did not include biodiversity or over-represented business interests (e.g., the Fashion Pact). The recognition and collaboration with historically marginalised actors such as fibre farmers and factory workers will be a crucial part of these platforms. To ensure their voices are heard, mechanisms for direct representation should be established, such as dedicated seats for these stakeholders in decision-making bodies, regular consultations and workshops to gather input, and feedback loops that allow them to influence discussions and policies actively. Moreover, civil society networks and campaigns, e.g., Clean Clothes, could be created or reinforced to bring together researchers, workers, policymakers, and consumers.	
2. Promotion of consumer awareness about global impacts, circularity and sufficiency.	**LP6 The structure of information flows** **LP7 The gain around driving positive feedback loops**
For major global changes in the fashion supply chain to happen, consumer awareness and education about the socio-ecological impacts of fashion should be promoted, to enable consumers make more informed choices. Moreover, education about circular fashion practices (e.g. reusing, repairing, swapping, recycling, etc) and the need to reduce consumption is fundamental, as well as the empowerment of consumers to push brands to produce sustainably and distribute their profits. The promotion of circular economy practices and consumer education can be approached by businesses (e.g., models based on service provision, clothes durability, and marketing sustainability), governments (e.g., the EU has started to work on it with the reform of Ecolabel and the Green Claims directive), CSOs (e.g., Fashion Revolution and Clean Clothes campaigns). However, a more explicit focus on consumption sufficiency should be included.	
3. Promotion of a material shift in fibre and apparel production through regulatory efforts and an agroecological transition	**LP 10 The structure of material stocks and flows**
A phase-out of new synthetic materials, a reduction in the use of raw natural materials and an agroecological transition in fibre production should be part of any global transformative pathway. International trade regulations in big consumption hubs such as the EU can go in the direction of regulating the materials of apparel products (e.g., the Ecodesign for Sustainable Products Regulation). Bans for unsustainable products (e.g., virgin polyester) could be enforced. Sticks and carrots can be used in the form of taxation and introducing tariffs for materials with high impacts on biodiversity (e.g., virgin cotton) and indirectly subsidising natural materials produced agroecologically, seeking collaboration from scientists (Science-Based Targets for Nature) and CSOs (e.g., IFOAM, Agroecology Europe) to set the standards. Those standards could be included in mandatory sustainability reporting (e.g., Corporate Sustainability Reporting Directive) and trade regulations (Corporate Sustainability Due Diligence Directive). Moreover, promising existing regulations such as the Anti-deforestation Directive could be improved by including crops such as cotton. To complement this, some effort should be put in empowering fibre producers to transition to agroecological practices, which could also improve their livelihoods and autonomy. Supporting and funding international farmers' organisations, such as La Via Campesina and IFOAM, can help to achieve this goal, as well as establishing living income prices for the commodities that they typically produce, e.g., cotton	
4. Empowerment of textile and fashion workers and local communities through global advocacy networks, trade regulations, and international cooperation	**LP4 The power to add, change, evolve, or self-organize system structure**

The previous interventions will cause fundamental changes in the nature of work and fibre production, including a potential reduction in the number of workers and the de-localisation of textile and apparel production to countries with weaker environmental and labour legislation. These will deepen the already existing labour right violations and inequalities in fashion supply chains. Workers' organisations and the local communities whose livelihood depends on fibre and textile production (e.g., cotton farmers) must be given the tools to participate and influence these changes. The international collaboration between CSOs and worker organisations in fashion production countries (e.g., through the Clean Clothes) has been fundamental in bringing workers' concerns into EU regulations (e.g., Corporate Sustainability Due Diligence Regulation). This regulation could be modified to include incentives for fashion companies to invest in the just transition (e.g., capacity building of workers). In the case of farmers, international farmer organisations such as La Via Campesina could help raise the concerns of fibre producers. Moreover, inter-governmental collaboration will be fundamental to distribute the costs of the just transition, in which Global North countries (biggest fashion consumers) could support fashion producing countries to adapt their labour market and empower their labour force (e.g., condition economic support to the implementation of ILO Conventions).

Strengthening collaborative efforts across these networks, such as the Clean Clothes and La Via Campesina, can amplify their impact and facilitate the exchange of best practices among various regions.

5. Promotion of a reduction in the absolute levels of fashion production and consumption through policy implementation	**LP2 The mindset or paradigm out of which the system — its goals, structure, rules, delays, parameters — arises.** **LP10 The structure of material stocks and flows**

The previous interventions serve to create the necessary conditions for an absolute reduction in fashion production and consumption, which is crucial to promote a nature-positive paradigm shift in fashion from quantity to quality. Although the EU Sustainable and Circular Textiles Strategy recognises overproduction and overconsumption as major problems, the strategy does not provide any clear action to tackle them. As shown by the examples of alcohol and tobacco, regulated on the basis of a 'public health' issue, strong regulation could be enforced to reduce fashion consumption, on the basis of a 'planetary health' issue. Fast fashion marketing or any deceiving fashion marketing could be prohibited. Obligations for fashion businesses to facilitate repairing and recycling services (i.e., 'right to repair') could also be enforced. Strong taxes or bans of fast fashion imports could be designed and implemented. Fashion companies not complying with environmental and human rights regulations could be fined, and that money could be used to subsidise smaller sustainable fashion businesses. Finally, making fashion companies responsible for their own waste, as partially included in the modification of the EU Waste Framework to include extended producer responsibility (ERP) for textiles, is another good option to reduce production.

Key stakeholders important for the realisation of the transformative pathway

Producers: this group includes a diverse range of stakeholders, from luxury brands such as Gucci and Stella McCartney, which are actively advocating for sustainable practices and materials, to local artisans who create eco-friendly products using traditional craftsmanship. Their engagement is crucial in promoting biodiversity-friendly practices within fashion supply chains.

International NGOs:

- **Fashion Revolution**: an organisation focused on transparency and ethics in the fashion industry, advocating for sustainable practices and consumer awareness around the environmental impacts of clothing production.

- **Clean Clothes Campaign**: this global alliance advocates for better working conditions in the garment industry, connecting environmental sustainability with social justice.
- **WWF (World Wildlife Fund)**: works on initiatives to reduce the fashion industry's environmental footprint and promote the sustainable use of resources.

Consumers: individuals and groups advocating for environmentally and socially responsible fashion choices can significantly influence market dynamics. Their demand for transparency and sustainable products drives brands to adopt eco-friendly practices.

Government entities: European Commission Directorate-General for Environment (formulates and implements environmental policies that govern sustainability in the fashion industry, including regulations related to circular economy initiatives); Department for Environment, Food & Rural Affairs in the UK (develops strategies to enhance environmental protections within the fashion industry, influencing regulations that support sustainability practices).

Potential Broader Impacts

Social justice and equity: improved livelihoods for marginalised communities through more equitable trade practices in the fashion industry.

Cultural shifts: increased consumer demand for sustainable products influencing fashion industry norms and practices.

Ecological Resilience: enhanced global biodiversity preservation through reduced environmental degradation linked to fashion.

Expected outcomes

Short-term: Heightened awareness of the fashion industry's impact on biodiversity amongst international stakeholders.

Medium-term: Strengthened global norms and standards for sustainable fashion practices across nations.

Long-term: Transformation of global market dynamics where sustainability becomes a prerequisite for trade, influencing other regions to adopt similar standards.

Opportunities and barriers for realising the transformative pathway identified by the case studies	
Enabling factors	Disabling factors
Consumer awareness: increased consumer awareness encourages a shift towards more sustainable production. Alternatives like slow fashion, second-hand markets, etc., are emerging. Sustainable fashion producers are also finding a niche market. However, these practices are a niche (i.e., mainly for people with high incomes) and do not tackle the structural drivers of biodiversity loss. A new ecological fashion culture moving beyond niche sustainable fashion markets toward a widespread cultural change that challenges the structural drivers of environmental harm, such as overproduction,	**Overproduction and dynamics of growth:** most strategies to deal with unsustainable production and consumption focus on making the Fashion system more circular (i.e., by promoting recycling, reusing, repairing, etc). However, 1) the numbers show that it is scarcely developed (see European Environment Agency, 2024), and 2) the benefits of circularity are not enough if production continues increasing (see Corvellec, Stowell & Johansson, 2022; Savini, 2023) Transformative strategies should tackle the primary goal of the fashion system, i.e., economic growth, and aim for fashion production

excessive consumption, and exploitative supply chains, is necessary. **Global dynamics and interconnected social (labour) and environmental (biodiversity) issues:** Since the search for minimised labour costs and weak environmental regulations are the main driver of the globalisation of the fashion system, this process directly fuels exploitative labour conditions and accelerates biodiversity degradation. This globalisation deepens social inequalities and perpetuates unequal ecological exchange (see Givens, Jorgenson & Xiaorui, 2019), where the environmental costs of production which affect biodiversity—such as deforestation, soil degradation, and water pollution—are disproportionately borne by regions in the Global South, often the same places where labour is most precarious. This process, in the end, makes labour and biodiversity issues inseparable. This also emphasises the importance of the international collaborations between CSOs and worker organisations, such as Clean Clothes Campaign, in both garment-producing (the Global South) and consumer market countries (the Global North) to push for changes in the sector that could improve its sustainability. Moreover, this emphasises that nature-positive futures cannot be achieved without social justice, as environmental destruction and worker exploitation stem from the same structural inequalities. **Rising consumer demand:** growing interest in sustainable and ethically produced goods can spur market changes. **Policy advocacy:** ongoing campaigns for stronger EU regulations can reinforce support for sustainability and biodiversity initiatives. **Cross-border collaboration:** international partnerships can facilitate resource sharing and best practices in sustainable fashion.	and consumption based on sufficiency and people's well-being within planetary boundaries. **Resistance from corporations:** powerful fashion brands may resist changes that threaten their profitability. **Political instability:** variations in governance and regulatory frameworks in producer countries can hinder effective reforms. **Lack of regulation and sustainability:** Lack of regulation or weak enforcement to adopt more sustainable practices can lead to continued environmental damage. **Consumer awareness:** Lack of awareness about the negative impacts of current consumption patterns can slow the shift toward sustainable practices.

4.4 Transformative pathways for students' nature relatedness in Hungarian public schools

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Introduction

This section outlines transformative pathways for enhancing nature relatedness in the education sector, based on the impact of experiential learning methods, examined in several Hungarian public schools. Education policy in the EU falls under the jurisdiction of Member States, meaning that national governments are responsible for the content and organisation of their educational systems, resulting in significant diversity across countries. While the EU can offer general guidelines and support for learning and knowledge sharing among Member States—such as through its Erasmus+ program—it lacks the authority to mandate a unified approach to nature-related education in Europe. Consequently, defining an EU-level Transformative Pathway for Education is challenging, as systemic changes will stem from context-specific transformations of national education systems.

Member States bear the primary responsibility for education, while the EU's role is to support them through research funding, knowledge exchange, and voluntary guidelines, without law enforcement authority. The EU collaborates with Member States to enhance national education systems and address shared challenges, as outlined in Articles 165 and 166 of the Treaty on the Functioning of the European Union. These articles emphasise the importance of quality education accessible to all by 2025 and promote mobility among learners and teachers across Member States within a culture of lifelong learning.

The following section explores the barriers and opportunities for transformative change within the education sector, followed by a discussion of the pathways at both the EU and global levels. The pathways are based on the data and insights from the case study, particularly focusing on barriers and opportunities for driving change within the education system, leverage points, desired intervention, potential broader impact and key stakeholders. The case study chose to employ the original twelve-point Meadows leverage point framework for a more detailed analysis. These pathways (at both the EU level and global level) demonstrate a logical progression of actions, illustrating how each step builds on the previous ones to achieve transformative outcomes for enhancing students' nature relatedness in education system.

Table 5. Transformative pathways for students' nature relatedness in Hungarian public schools

Goal of the EU transformative pathway
Integration of nature-related experiential learning into the EU education system, fostering environmental stewardship and sustainable citizenship
Intervention identified by the case study
Integration of nature-related experiential learning modules into national curricula
Desired change as a result of the intervention

Systemic integration of nature-related experiential learning into education curricula across all EU Member States:

- **Curriculum reform:** updating national curricula to include experiential learning modules (e.g., school gardens, outdoor learning) that foster a deeper connection with nature.
- **Teacher training:** equipping educators with the necessary skills and knowledge to effectively implement nature-based educational approaches.
- **Resource allocation:** ensuring sufficient funding for schools to create and maintain resources necessary for experiential learning (e.g., school gardens, equipment, field trips).
- **Policy alignment:** harmonising national education policies across EU member states to support nature-based learning initiatives, aligning with EU-level strategies for biodiversity and sustainable development.

Action steps to realise the intervention	Targeted leverage point
1. Enhancement of funding for nature-based education initiatives	**LP8 The strength of negative feedback loops, relative to the impacts they are trying to correct against** **LP10 The structure of material stocks and flows**
This step is foundational, as it provides the resources needed for the other steps. Securing funding opportunities for EU Member States is crucial to support the establishment and maintenance of school gardens, access to green spaces, and outdoor learning programs, leveraging existing EU funding streams and aligning with the EU Biodiversity Strategy for 2030, Pillar 3. However, it's important to recognise that local-scale actors, such as educators and community groups, may not be fully aware of regional EU opportunities or the specifics of the Biodiversity Strategy 2030. To address this gap, creating stronger linkages between local initiatives and EU funding bodies is essential. This can be achieved through targeted outreach and capacity-building efforts that inform local stakeholders about available resources. Additionally, promoting local partnerships and community involvement can enhance funding opportunities and foster a collaborative approach to nature-based education.	
2. Development and dissemination of best practices and teacher training resources	**LP5 The rules of the system** **LP6 The structure of information flows**
With funding secured, this step becomes achievable. Exemplary programmes and training materials can be developed and tested, knowledge can be shared, and educators can be empowered to implement experiential learning strategies effectively. This directly supports Paragraph 6.e of the Council Recommendation and is also in line with the EC's GreenComp framework (the European sustainability competence framework). Including feedback loops where educators can share experiences with best practices will help continually improve training resources and methodologies. When best practices are shared, educators can apply new insights and innovative practices, which will lead to an enhanced understanding of effective teaching strategies. This iterative process will not only refine training materials based on real-world application but also foster a collaborative learning community among educators, ultimately improving student outcomes in nature-based education	
3. Advocacy for EU-Wide recommendations on nature-based education	**LP3 The goals of the system** **LP4 The power to add, change, evolve, or self-organize system structure**

With successful pilot programmes and training resources in place, advocating for policy changes becomes more persuasive. Based on our empirical work, these could include the following actions:

- increased autonomy of teachers to apply diverse teaching approaches
- improved opportunities to teach biodiversity-related subjects (e.g. geography, biology, chemistry, physics) in an integrated way, and combine them with other subjects (e.g. with arts and literature) to avoid silo-thinking
- the integration of experiential learning methods (school gardens, outdoor education) into national curricula across EU Member States can be promoted, drawing on the Council Recommendation on learning for the green transition and sustainable development 2022 (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2022_243_R_0001).

This step aligns with Paragraph 5.a. of the Council Recommendation (*"Provide learners, from the time they are in pre-school, with opportunities to understand, engage with and value the natural world and its biodiversity, create a sense of curiosity and wonder and learn to act for sustainability, individually and collectively*"). Moreover, advocating for policies that encourage the establishment of community gardens and outdoor classrooms can further reinforce the integration of experiential learning across the education system, supporting a more comprehensive approach to environmental education.

Key stakeholders important for the realisation of the intervention

- National-level ministries of education within EU countries play a major role.
- EU-level policymakers and organisations (e.g., the European Commission, relevant EU agencies, such as European Environment Agency, European Education and Culture Executive Agency, Directorate-General for Education, Youth, Sport, and Culture hold significant influence.
- EU Parliament, national Ministries of Education, teachers' unions, decision makers of school districts, environmental NGOs active at EU level, EU-funded research institutions, national school garden networks.

Potential broader impact

Enhanced environmental stewardship within the EU, increased participation in environmental initiatives, improved mental and physical health outcomes for students, positive contribution to achieving EU biodiversity and sustainability targets.

Expected outcomes

Short-term outcomes: increased teacher awareness of and engagement with experiential learning methods; initial pilot programmes implemented in a few schools (EU) improved student attitudes, values and behaviour towards nature in participating schools/countries

Medium-term outcomes: widespread adoption of experiential learning modules within national curricula in several EU Member States; increased funding for nature-based education initiatives within the EU

Long-term outcomes: systemic change within the EU's educational framework; widespread integration of nature-based learning across all levels of education; demonstrable improvements in environmental stewardship and sustainable practices among EU citizens.

Goal of the global transformative pathway

Nature-related experiential learning is to be promoted worldwide, fostering global environmental citizenship and sustainable practices.

Intervention identified by the case study

- A global network for nature-based education is to be developed

Desired change as a result of the transformative pathway

Widespread adoption of nature-related experiential learning as a core component of education systems worldwide:

- **International collaboration:** fostering global partnerships among educational organisations, NGOs, and governments to share best practices and resources for nature-based education.
- **Curriculum development:** supporting the development of inclusive and culturally relevant curricula that integrate nature-based learning across different educational settings.
- **Capacity building:** investing in teacher training and capacity-building programmes to equip educators with skills in nature-based pedagogies, considering diverse contexts and educational needs.
- **Policy advocacy:** promoting the integration of nature-based learning into national strategies aligned with global sustainable development goals, such as SDG 4 (quality education) and SDG 13 (climate action).

Action steps	Targeted leverage point
1. Support of research and capacity building	**LP 5 The rules of the system** **LP6 The structure of information flows**
This foundational step provides the evidence base and skilled workforce needed for subsequent actions. Funding international research projects and implementing capacity-building programmes for educators are crucial for demonstrating the effectiveness of nature-based education in diverse contexts. This directly supports SDG 4 (Quality Education) and Target 4.7. Research should also assess the broader impacts of nature-based education, including its effects on local communities, health outcomes, and consumption patterns.	
2. Promotion of nature-based education through international collaboration.	**LP 3 The goals of the system.** **LP4 The power to add, change, evolve, or self-organize system structure**
With research establishing the programme's effectiveness, this step becomes more impactful. Global partnerships among educational organisations, NGOs, researchers, and governmental agencies already exist, exemplified by the IUCN Commission on Education and Communication, which focuses on promoting effective education and communication strategies in conservation. These partnerships can be broadened to share best practices and promote the integration of nature-based education into national curricula. This step directly supports Target 21 of the Kunming-Montreal Global Biodiversity Framework. Additionally, engaging stakeholders from the food and agriculture sectors can strengthen the relevance of nature-based education and enhance opportunities for collaboration.	
3. Advocacy for sustainable development goals (SDGs) integration	**LP 8 The strength of negative feedback loops, relative to the impacts they are trying to correct against.** **LP10 The structure of material stocks and flows**

With evidence and international collaboration in place, advocating for SDGs integration becomes stronger. Promoting the integration of nature-based education into national strategies for achieving the Sustainable Development Goals (particularly SDG 4 and SDG 13) is more persuasive with demonstrable success and international support. Furthermore, incorporating advocacy for local, community-driven initiatives (such as community gardens) can help align efforts with broader goals of sustainability and local food production

Key stakeholders important for the realisation of the transformative pathway

International organisations:

- **UNESCO (United Nations Educational, Scientific and Cultural Organization)**: plays a vital role in promoting global initiatives for educational sustainability and biodiversity, supporting the integration of nature-based education in curricula worldwide.
- **UNEP (United Nations Environment Programme)**: advocates for environmental education and sustainable practices, providing resources and frameworks to nations for effective implementation of biodiversity-related education.
- **IUCN (International Union for Conservation of Nature)**: engages in research and advocacy to highlight the importance of biodiversity conservation in educational settings, promoting effective education and communication strategies.

National Ministries of Education: these bodies are crucial in shaping educational policies and practices at the country level, ensuring that nature-related experiential learning is incorporated into national curricula. Their involvement in funding and resource allocation directly influences how education systems address biodiversity.

International NGOs: Environmental Education NGOs (e.g., **Earthwatch**): support research and field-based environmental education initiatives, helping to implement experiential learning programmes that connect youth with nature.

Global Networks of Educators: collaborative networks that share best practices and resources facilitate the integration of nature-based education. Examples include the **Global Learning Network** and the **Network for Education and Academic Sustainability**, which work to foster international cooperation and resource sharing among educators

Academic Institutions: universities and research centres that focus on environmental science and education play a significant role in conducting research on pedagogical approaches to biodiversity education and providing training resources for educators.

Potential broader impact

Increased global environmental awareness and action; strengthened international cooperation on environmental education; promotion of sustainable practices on a global scale; contribution towards achieving global sustainable development goals related to education and environmental protection.

Expected outcomes

Short-term outcomes: increased teacher awareness of and engagement with experiential learning methods; initial pilot programmes implemented in a few countries; improved student attitudes, values and behaviour towards nature in participating schools/countries.

Medium-term outcomes: establishment of a global network for sharing best practices and resources for nature-based education; increased international cooperation on environmental education; adoption of nature-based learning in several countries worldwide, supported by regional and international collaborations.

Long-term outcomes: global shift towards nature-based learning as a standard in education, creating a generation of environmentally conscious citizens across the globe; significant improvements in global environmental awareness and action; a reduction in the global environmental footprint from increased sustainable practices and reduced consumption.

Opportunities and barriers for realising the transformative pathway identified by the case studies	
Enabling factors	Disabling factors
EU level: existing EU initiatives related to environmental education and sustainability; strong funding opportunities from EU programmes; the potential to set an example for other regions; existing networks of collaboration among European educational institutions. **Global level:** increasing global interest in sustainable development; potential for creating international partnerships and collaborative initiatives; leveraging international organisations (e.g., UNESCO, UNEP, IUCN) to champion environmental education; opportunities for knowledge exchange and resource sharing.	**EU level:** funding limitations; differences in national education systems across EU member states (while differences in national education systems themselves may not be a barrier, the lack of adaptation or support for these differences can create challenges in implementing EU initiatives); resistance to curriculum changes from some ministries, teachers or administrators; bureaucratic hurdles in implementing EU-wide initiatives. **Global level:** varied access to resources and technology in different countries; differing educational priorities and national contexts; political instability in some regions; challenges in coordinating efforts across diverse political and cultural landscapes.

4.5 Transformative pathways for system change in sustainable finance sector

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Introduction

The pathways outlined in this chapter are based on the data and insights from the case study presented earlier, particularly focusing on leverage points, the narrative of the intervention, and the barriers and opportunities for driving change within the financial sector. The desired transformative change in this case study is to enhance sustainable investment behaviour by improving the robustness and communication of ESG (Environmental, Social, and Governance) indicators, thereby aligning financial decision-making with biodiversity stewardship and the transition to a green economy. The case study utilised Abson's four-point leverage point scale for its simplicity and clarity. These pathways (at both the EU and global levels) demonstrate a logical progression of actions, illustrating how each step builds on the previous ones to achieve transformative outcomes through enhanced sustainable investment behaviours in the financial sector prioritising biodiversity. The chapter starts with a discussion of the pathways at both the EU and global levels and is followed by exploring the barriers and opportunities for transformative change in finance sector.

Table 6. Transformative pathways (EU level, global level) for system change in sustainable finance sector

Goal of the EU transformative pathway	
Establishment of sustainable investment practices that incorporate biodiversity considerations into financial frameworks	
Intervention identified by the case study	
• Improving the quality and use of biodiversity metrics • Integrating biodiversity metrics into decision-making processes	
Desired change as a result of the intervention	
Enhanced transparency and traceability: implementation of regulations requiring comprehensive disclosure of sourcing information for investments and financial products, ensuring accountability in supply chains. **Shift toward sustainable practices:** transition in investment priorities toward supporting small-scale, agroecological farming and investments that protect biodiversity. **Integration of biodiversity goals:** inclusion of biodiversity protection initiatives in financial regulations and trade agreements to align economic goals with environmental sustainability.	
Action steps to realise the intervention	**Targeted leverage point**
1. Enhancement of transparency in biodiversity metrics reporting	**LP Material**
Collaboration with stakeholders, including financial institutions, regulatory bodies, and biodiversity experts, is to be conducted to create a set of standardised metrics that can be integrated into financial reporting. This initiative will build on existing frameworks and efforts in the field, such as the guidelines established by the United Nations Environment Programme Finance Initiative (UNEP FI), the **Accountability for Nature framework**, and the January 2024 report on the **Comparison of Nature-Related Assessment and Disclosure Frameworks and Standards**. These resources illustrate best practices for assessing and reporting biodiversity impacts and highlight the importance of coherent metrics. Platforms are to be established where biodiversity data can be publicly accessed, allowing for transparency and third-party verification of the metrics reported by financial institutions. Incorporating public engagement initiatives can further strengthen accountability, encouraging stakeholders to actively monitor and question reported data. Research organisations in each country should verify which data sources provide valuable insights for reporting purposes and for actively preventing nature loss and reducing greenhouse gas (GHG) emissions.	
2. Improvement of nature risk screening tools within financial institutions	**LP Processes**
Collaboration with financial institutions is to be undertaken to refine existing nature risk screening tools, ensuring they incorporate comprehensive biodiversity metrics and reflect best practices in sustainability reporting. Training for financial analysts and investment managers on the understanding and application of biodiversity metrics within their assessment frameworks is to be provided, including workshops and seminars focusing on the relevance of biodiversity in credit assessments and investment decisions. Support for the incorporation of biodiversity metrics into the due diligence processes for investments is to be offered. Additionally, developing user-friendly tools and resources can facilitate the adoption of these metrics within investment decision-making, making it more accessible for all stakeholders.	
3. Advocacy for stronger regulatory frameworks at the EU Level	**LP Design**
Coalitions with environmental NGOs, business associations, and independent researchers are to be built to advocate for the inclusion of biodiversity considerations in financial regulations such as the EU Corporate Sustainability Reporting Directive. Policy proposals outlining the necessity and benefits of integrating biodiversity metrics into financial regulations are to be developed and disseminated,	

highlighting potential economic advantages. The establishment of monitoring frameworks that track the implementation of biodiversity provisions in financial regulations is to be encouraged, ensuring compliance and accountability among financial institutions.

4. Raising awareness about the significance of biodiversity in investment practices, promoting informed decision-making among investors	**LP Intent**

Campaigns highlighting biodiversity risks and their implications for investment returns are to be designed and implemented, utilising various media channels to reach diverse investor audiences. Engagement with financial advisors and professionals is to occur to incorporate biodiversity education into their investment recommendations, providing resources focused on the value of sustainable investments. Developing case studies that showcase successful biodiversity-positive investments can help illustrate the potential financial and ecological returns involved, thus inspiring more investors

Key stakeholders important for the realisation of the intervention

European Commission: Plays a pivotal role in developing and enforcing policies related to sustainable finance and biodiversity, particularly through regulations such as the Corporate Sustainability Reporting Directive (CSRD).
European Securities and Markets Authority (ESMA): Provides guidelines to improve the regulatory framework surrounding financial markets, influencing how companies report environmental impacts in their financial disclosures.
European Investment Bank (EIB): As the bank of the EU, it focuses on financing projects that align with environmental sustainability goals, emphasising investments in initiatives that protect and enhance biodiversity.
European Environment Agency (EEA): Supports data collection and reporting on environmental indicators, playing a key role in informing policymakers about the impact of financial activities on biodiversity.
Environmental NGOs: organisations focused on advocating for sustainable practices among businesses and policymakers.

- **WWF (World Wildlife Fund)**: advocates for policies that protect biodiversity and promotes accountability in the finance sector, encouraging investments that prioritise sustainability.
- **Oxfam**: engages in efforts to ensure that investment practices are equitable and supportive of both people and biodiversity, providing a voice for marginalised communities impacted by unsustainable practices.

Expected outcomes

Short-term: increased transparency in European business and trade practices, resulting in greater accountability among companies exposed to biodiversity impacts.
Medium-term: adoption and implementation of sustainable production standards by EU businesses, leading to a reduction in biodiversity loss and ensuring accountabilities along the supply chain.
Long-term: significant transformation in European financial policies prioritising sustainability and social equity, culminating in harmonised biodiversity conservation across investments.

Goal of the global transformative pathway

Mobilisation of a global coalition for sustainable finance that prioritises biodiversity conservation.

Intervention identified by the case study

- Development of standardised biodiversity measurement practices.
- Promotion of regulatory frameworks supporting biodiversity in finance.

Desired change as a result of the transformative pathway	
Establishment of international sustainability standards: development and enforcement of global standards for investments that promote environmental responsibility. **Comprehensive data sharing initiatives:** creation of platforms for transparent sharing of biodiversity impact data among countries, fostering informed decision-making. **Strengthening of global advocacy networks:** mobilisation of global organisations to advocate for sustainable investment practices and environmental protection across multiple sectors.	
Action steps	Targeted leverage point
1. Creation of standardised biodiversity assessment frameworks across countries	**LP Material**
Collaboration with international organisations, NGOs, and experts is to be conducted to create standardised biodiversity data sources and assessment frameworks that can be adopted by nations globally. Identification and dissemination of best practices related to biodiversity measurement and reporting are to be performed, facilitating alignment among countries. Workshops and training programmes focused on implementing standardised data sets, metrics and methodologies are to be organised for stakeholders in various countries. Involving cross-sectoral stakeholders, including representatives from agriculture and local communities, can ensure that these frameworks address diverse needs and contexts.	
2. The empowerment of global regulatory initiatives through information-sharing	**LP Processes**
International networks for biodiversity information exchange among governments, businesses, and NGOs are to be formed, promoting collaboration and shared learning. Platforms for collecting and disseminating data on biodiversity impacts of investments are to be created, enabling real-time access to relevant information for stakeholders. Advocacy for the inclusion of biodiversity metrics in trade agreements and international financial regulations is to be undertaken, pushing for harmonised reporting standards. Establishing joint initiatives with these networks to conduct sector-specific assessments can help tailor biodiversity standards to industry-specific contexts, increasing their applicability and effectiveness.	
3. Building partnerships among financial institutions and stakeholders	**LP Design**
Engagement with organisations such as the United Nations Environment Programme Finance Initiative (UNEP FI) and World Bank is to be pursued to recognise biodiversity as a critical component of sustainable finance. Collaborative projects aimed at investing in biodiversity-positive solutions are to be launched, pooling resources from financial institutions and stakeholders across sectors.	
4. Mobilisation of global advocacy networks for sustainable finance	**LP Intent**
Campaigns aimed at raising awareness about the impact of biodiversity loss on investments and economic stability are to be launched, targeting diverse audiences, including investors and policymakers. Collaboration with grassroots organisations and community groups is to be facilitated to ensure that local voices are included in global discussions about sustainable finance and biodiversity. Advocacy efforts are to be coordinated to pressure governments and institutions to establish strong biodiversity protections in financial regulations and investment practices.	
Key stakeholders important for the realisation of the transformative pathway	
Standard-setting & policy organisations: • **United Nations Environment Programme Finance Initiative (UNEP FI)**: works with the financial sector to promote sustainable finance, helping to establish standards that integrate biodiversity considerations into investment practices. • **World Bank**: engages in international development financing with a focus on incorporating biodiversity conservation into economic practices, providing support for projects that align with sustainable environmental goals.	

- **Organisation for Economic Co-operation and Development (OECD)**: offers guidelines and frameworks for sustainable investment, facilitating collaboration among member countries to harmonise biodiversity-related financial practices.
- **Taskforce on Nature-related Financial Disclosures (TNFD)**: provides a framework for companies and financial institutions to disclose their impacts and dependencies on nature, promoting accountability and encouraging biodiversity-positive decisions.

Multinational Corporations: companies such as Nestlé and Unilever, which are involved in agribusiness, that affect biodiversity through their supply chains and operational practices, are essential for implementing sustainable practices in investment decisions.

International NGOs: **WWF** (advocates for policies that protect biodiversity and promotes accountability in the finance sector, encouraging investments that prioritise sustainability); **Oxfam** (engages in efforts to ensure that investment practices are equitable and supportive of both people and biodiversity, providing a voice for marginalised communities impacted by unsustainable practices).

Potential Broader Impact

Ecological Resilience: preservation of global biodiversity through implementation of sustainable practices within investments.
Global Market Transformation: setting a precedent for sustainability standards influencing other regions and promoting coordinated international policies

Expected outcomes

Short-term: heightened awareness among international stakeholders regarding the impacts of investment decisions on biodiversity.
Medium-term: strengthened international norms and standards for incorporating biodiversity considerations into financial practices across all countries engaged in related sectors.
Long-term: transformation of global financial market dynamics, establishing sustainability as a prerequisite for trade and impacting financial practices in various regions worldwide.

Opportunities and barriers for realising the transformative pathway identified by the case studies	
Enabling factors	Disabling factors
Rising consumer demand: increasing interest among consumers for sustainable and ethically sourced products can drive financial markets toward more sustainable practices. **Policy advocacy initiatives:** ongoing advocacy for progressive EU regulations can reinforce support for biodiversity initiatives within finance. **International collaboration:** cross-border initiatives can foster shared knowledge, technical support, and resource mobilisation, amplifying the impact of sustainability efforts. Additionally, initiatives like the ALIGN project, which seeks to establish standardised biodiversity measurement and valuation practices, provide a promising avenue for creating consistent and comparable metrics to inform investment decisions better. **Innovation in sustainable finance:** investment in sustainable finance technologies that empower stakeholders to make informed decisions regarding biodiversity impacts can enhance accountability. For instance, developing more robust nature risk screening tools that incorporate spatially explicit data offers a	**Political factors:** shifting political landscapes in Europe and globally may disrupt the implementation of pilot sustainability policies and initiatives. **Consumer awareness challenges:** limited awareness and understanding of the impacts of investments on biodiversity can impede demand for sustainable products. **Complexity of data collection:** the lack of reliable and spatially explicit biodiversity data can hinder effective investment evaluations and the implementation of nature risk screening tools. **Cognitive biases:** cognitive biases among investors, such as "no information bias" (the tendency to ignore risks due to a lack of complete data) and "due diligence bias" (over-reliance on traditional financial risk metrics), obstruct the integration of biodiversity metrics into decision-making. These biases contribute to the undervaluation of biodiversity risks, leading investors to overlook long-term environmental consequences. **Lack of awareness or expertise:** lack of awareness or expertise among financial actors

pathway to improve the materiality and accuracy of biodiversity risk assessments. **Data accessibility:** enhanced access to detailed and relevant data on biodiversity could empower investors to evaluate investments more accurately, influencing their Environmental, Social and Governance analyses and informing engagement strategies with the companies they invest in as part of their stewardship responsibilities.	and companies about biodiversity risks and opportunities can slow down the adoption of biodiversity-positive strategies. Many institutions may not have the in-house expertise to assess biodiversity impacts, making implementation difficult.

4.6 Transformative pathways for system change in agriculture sector (with a focus on agricultural labour shortages, migration patterns, and biodiversity-friendly farming practices)

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Introduction

This chapter examines the barriers and opportunities for transformative change within the agricultural sector and outlines pathways for enhancing biodiversity and addressing labour shortages in the EU. The transformative change envisioned in this case study focuses on enhancing the interplay between labour dynamics and biodiversity, contributing to more informed policies and practices within the context of European agriculture. The pathways outlined in this chapter are based on the data and insights from the case study presented earlier, particularly focusing on leverage points, the narrative of the intervention, and the barriers and opportunities for driving transformative change. The case study opted for Abson's four-point leverage point scale to facilitate ease of understanding. These pathways (at both the EU and global levels) demonstrate a logical progression of actions, illustrating how each step builds on the previous ones to achieve transformative outcomes in agriculture sector.

Table 7. Transformative pathways (EU level, global level) for system change in agriculture sector (with a focus on agricultural labour shortages, migration patterns, and biodiversity-friendly farming practices)

Goal of the EU transformative pathway
A more sustainable and equitable EU agricultural system that supports biodiversity and ensures fair labour conditions. While the EU Biodiversity Strategy for 2030 primarily focuses on environmental objectives, ensuring fair labour conditions in agriculture is essential for achieving broader sustainability goals, as equitable practices contribute to resilient farming systems.
Intervention identified by the case study
A revised Common Agricultural Policy that prioritises biodiversity, social equity, and long-term food security.

Desired change as a result of the intervention	
Enhanced biodiversity: a substantial increase in biodiversity across EU achieved through the adoption of biodiversity-friendly farming practices. **Fair labour conditions:** improved working conditions, wages, and legal protection for all agricultural workers, including migrant workers. **Policy alignment:** coherent and effective policies at the EU level that support biodiversity conservation and ensure fair labour conditions.	
Action steps to realise the intervention	Targeted leverage point
1. Revision of Common Agricultural Policy subsidies to incentivise biodiversity-friendly practices and fair labour conditions	**LP Design, Intent**
Comprehensive reforms of the Common Agricultural Policy are to be supported to prioritise agroecological practices, providing funding, and incentives for small-scale and large-scale farmers transitioning to sustainable production methods, thus creating the conditions for subsequent steps. Incorporation of principles from the EU Biodiversity Strategy for 2030 is to be ensured, focusing on enabling transformative change and promoting sustainable food systems. Additionally, ensuring that reforms to the Common Agricultural Policy include metrics for both environmental and social outcomes simultaneously will help create a more holistic assessment of and support for agricultural practices.	
2. Development and implementation of training programmes for farmers and migrant workers on biodiversity-friendly farming and worker rights	**LP Processes, Intent**
Supported by the European Pillar of Social Rights Action Plan 2030, training programmes will empower both farmers and migrant workers with critical knowledge of biodiversity-friendly practices and help migrant workers understand their rights and the context of their work. Leveraging partnerships with educational institutions and NGOs could enhance the quality and outreach of these training programmes, creating a supportive learning environment.	
3. Monitoring and evaluation of the impact of Common Agricultural Policy reforms on biodiversity and labour conditions	**LP Processes**
Monitoring and evaluation must be informed by data collection and analysis methods to measure the effectiveness of Common Agricultural Policy reforms. Establishing stakeholder-led monitoring groups can ensure transparency and accountability, allowing for community input in evaluating progress.	
Key stakeholders important for the realisation of the intervention	
European Commission: responsible for shaping agricultural policies and ensuring alignment with sustainability goals through initiatives such as the Common Agricultural Policy (CAP) and the EU Biodiversity Strategy for 2030. **European Parliament**: plays a key role in the legislative process concerning agricultural and environmental policies, supporting measures that promote fair labour conditions and biodiversity conservation. **European Food Safety Authority (EFSA)**: provides scientific advice to inform regulations that safeguard biodiversity and food security within the agricultural sector. **European Labour Authority (ELA)**: ensures that worker rights are upheld across EU member states and promotes fair working conditions, particularly for migrant agricultural workers. **National governments** (Ministries of Agriculture, Environment, Labour, Education) **Academic Institutions** (universities and research centres - e.g. Wageningen University in the Netherlands), playing a vital role in generating knowledge and sharing best practices for sustainable agriculture. **NGOs:** Oxfam, WWF **Farmers' organisations:** Copa-Cogeca, National Farmers' Union (the UK), German Farmers' Union, engaging in lobbying for farmers' rights and providing expertise on sustainable agricultural practices. **Agricultural worker unions:** European Federation of Food, Agriculture and Tourism Trade Unions (represents agricultural workers across Europe, advocating for improved working conditions, fair wages, and social protections for all agricultural workers, including migrants); National Worker	

Unions (national agricultural worker unions across EU member states work to defend the rights of agricultural workers).
Expected outcomes
Short-term: increased awareness among stakeholders of the linkages between agricultural practices, migration, and biodiversity; pilot projects implementing biodiversity-friendly farming practices and improved worker protections; initial data collection on the impact of these initiatives. **Medium-term:** widespread adoption of biodiversity-friendly farming practices in selected regions; improved working conditions for migrant and domestic agricultural workers; noticeable improvements in biodiversity indicators in targeted areas; initial policy adjustments based on data analysis. **Long-term:** systemic changes in EU agricultural policy leading to a significant increase in biodiversity-friendly farming; improved food security; fair labour conditions for all agricultural workers; positive impacts on rural economies; a more resilient and sustainable EU agricultural system; systemic socio-ecological thinking among principal stakeholders entails an integrated approach where green and equitable agricultural practices are viewed in conjunction rather than as distinct entities.

Goal of the global transformative pathway	
To promote sustainable agricultural practices globally that enhance biodiversity, ensure fair labour conditions for all agricultural workers, and contribute to global food security, aligned with the *Kunming-Montreal Global Biodiversity Framework* and the ***Sustainable Development Goals*.**	
Intervention identified by the case study	
Creation of a global initiative to support sustainable agricultural practices and fair labour conditions	
Desired change as a result of the transformative pathway	
Enhanced biodiversity: a substantial increase in biodiversity across EU and globally agricultural landscapes, achieved through the adoption of biodiversity-friendly farming practices. **Fair labour conditions:** improved working conditions, wages, and legal protection for all agricultural workers, including migrant workers. **Sustainable agriculture:** a transition from intensive farming practices to more sustainable, resource-efficient, and resilient farming systems. **Policy alignment:** coherent and effective policies at the EU and global levels that support biodiversity conservation and ensure fair labour conditions.	
Action steps	Targeted leverage point
1. Promoting investment in sustainable agricultural practices	**LP Design, Intent**
The objective is to mobilise financial resources and encourage a global shift toward sustainable agricultural practices that enhance biodiversity. This aligns with Target 10 of the Kunming-Montreal Global Biodiversity Framework and SDG 15, which focuses on managing terrestrial ecosystems sustainably. To achieve this, investments in agroecological practices and sustainable land management need to be promoted, while also advocating for policies that support sustainable agriculture in international development. There is also the need for investment in research that promotes agroecological farming practices as well as investment in agroecologically-friendly mechanisation. Innovative financing mechanisms by governments, international organisations and private investors that support small-scale and large-scale farmers prioritising and practising sustainable agricultural practices and climate-friendly strategies, as well as those engaged in innovative sustainable farming initiatives are also essential. The Kunming-Montreal Framework highlights the need for increased funding for biodiversity conservation, making financial mobilisation crucial for achieving its targets, in line with SDG 15's goals. In addition to financial support, partnerships with local organisations can foster community involvement and ensure that investments directly benefit those engaged in agriculture.	
2. Strengthening international labour standards and worker protections	**LP Processes, Intent**

Ensuring fair labour conditions for all agricultural workers, regardless of their migration status, is crucial. This commitment directly supports the objectives of SDG 10. Support for initiatives aimed at improving working conditions, increasing wages, and expanding access to essential healthcare services is essential. Incorporating education about labour rights into training programmes for agricultural workers can further empower them to advocate for fair treatment and improved conditions. Formation of workers unions by agricultural workers can also leverage on the strength of a united workforce to advocate for protection of their rights, improve workers' living standards and ensure fair labour conditions as well as access available training and development programmes.

3. Building capacity and sharing best practices in sustainable agriculture	**LP Processes**
Global collaboration and knowledge-sharing are vital for promoting sustainable agriculture and biodiversity conservation. Developing training programmes focused on sustainable practices, such as agroecology and climate-smart agriculture, and creating platforms for sharing best practices through South-South and North-South collaborations are essential. Moreover, including the knowledge of indigenous practices can enrich learning and improve the adaptability of sustainable agriculture strategies across different regions.	

4. Monitoring and evaluation of sustainable agriculture initiatives	**LP Processes**
Monitoring and evaluation mechanisms are essential for tracking progress toward sustainable agriculture goals, informing policy adjustments, and ensuring accountability, reflecting the principles of the Kunming-Montreal Global Biodiversity Framework and the SDGs. This involves establishing data collection systems for biodiversity indicators and labour conditions, using this information to adapt policies and programmes, and regularly reporting on progress toward global targets. This aligns directly with the monitoring and evaluation components inherent in both the Framework and the SDGs**.** Engaging local communities in monitoring efforts can enhance data accuracy and foster a sense of ownership over agricultural sustainability initiatives.	

Key stakeholders important for the realisation of the transformative pathway
FAO (Food and Agriculture Organisation): works to promote sustainable agricultural practices globally, providing guidance and support for biodiversity-friendly farming methods. **ILO (International Labour Organisation)**: focuses on establishing international labour standards and promoting decent work conditions for all agricultural workers, regardless of migration status. **CBD (Convention on Biological Diversity)**: advocates for the integration of biodiversity considerations into agricultural policies and practices, facilitating international cooperation on biodiversity conservation. **International NGOs**: Oxfam (ensures that agricultural practices are sustainable and equitable, advocating for the rights of both workers and environmental conservation; WWF (engages in initiatives aimed at protecting biodiversity and promoting sustainable farming practices globally). **Multinational Corporations**: companies involved in agricultural production and trade, such as Bayer and Cargill, have significant influence over farming practices and can drive the adoption of biodiversity-friendly methods through sustainable sourcing policies. **Academic Institutions**: research centres and universities conducting studies on agricultural practices and biodiversity (e.g. Wageningen University in the Netherlands, University of California, Davis (USA).

Opportunities and barriers for realising the transformative pathway identified by the case studies	
Enabling factors	Disabling factors
Policy support: EU policies such as the Common Agricultural Policy, the EU Biodiversity Strategy for 2030, and other relevant initiatives provide a supportive framework for transformative changes regarding the relationship between labour availability, particularly that of migrant workers, and	**Resistance to change** resistance from some farmers to adopting new, biodiversity-friendly practices; opposition to strengthened labour regulations. **Economic challenges:** the higher costs associated with biodiversity-friendly farming practices may pose an initial economic challenge for some farmers.

biodiversity conservation in agricultural landscapes. **Broad bottom-up support including social and environmental NGOs.** **Technological advancements:** advances in precision agriculture, sustainable pest and disease management, and other agricultural technologies can help reduce negative impacts on biodiversity while improving efficiency. **Consumer demand:** increasing consumer awareness and demand for sustainably produced food. **International collaboration:** opportunities for collaboration among countries to share best practices, coordinate policies, and support each other in achieving sustainable agriculture goals. **Innovative financing mechanisms:** explore innovative financing mechanisms to encourage adoption of biodiversity-friendly practices.	**Data gaps:** insufficient data on the impacts of specific farming practices on biodiversity and labour conditions. **Political will:** lack of political will or commitment to implementing significant changes in agricultural policy at both EU and global levels. **Coordination challenges:** the need for effective coordination between various actors (EU, national governments, NGOs, etc.) to facilitate the adoption and implementation of sustainable agricultural practices and improved worker protection. Interinstitutional coordination / cooperation (e.g. environmental with agricultural policy groups).

4.7 Policy alignment and gaps

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In this section, we compare the proposed transformative pathways for the EU and global level against existing EU and global policies to assess the extent to which existing policies currently engage with and/or support the transformative pathways identified. We also try to identify gaps where new policies or amendments could support these proposed pathways. **This includes also offering concrete policy recommendations - specific and actionable suggestions.**

4.7.1. Transformative pathways for institutional systems change in agriculture sector (with a focus on enhancing agrobiodiversity through seed bank network)

The transformative pathways identified for the agricultural sector show strong alignment with existing EU and global policies, advocating for greater agrobiodiversity, sustainability, and inclusion in line with the EU Biodiversity Strategy 2030, Common Agricultural Policy 2023 - 2027, and international frameworks like the Nagoya Protocol, ITPGRFA and UNDROP. Addressing specific gaps, such as harmonising seed laws across EU states and ensuring adequate international cooperation, could significantly enhance the pathways' effectiveness in promoting a resilient and sustainable agricultural landscape.

Alignment of proposed transformative pathways with existing EU and global policies
EU-Level Pathway Alignment:

The EU Biodiversity Strategy for 2030 is aligned with the pathway through its focus on reducing chemical pesticide usage, increasing organic farming, and enhancing agroecological practices, all reflected in the framework proposed by the pathways.
Additionally, the **Common Agricultural Policy (CAP)** 2023 – 2027 complements the pathways by supporting small-scale farmers and promoting sustainable agricultural practices, which align with CAP's eco-schemes and strategic approach to environmental sustainability.
Similarly, the **EU Farm to Fork Strategy** resonates with the pathways' focus on empowering local seed systems and knowledge exchange, emphasising agroecological approaches and sustainability within food systems.

Global-Level Pathway Alignment:
The **Kunming-Montreal Global Biodiversity Framework** is supported by the pathways through their alignment with targets to enhance biodiversity and sustainability in agriculture **(Target 10**) and promote gender equality and women's empowerment (**Target 23**), achieved in-part through inclusive seed systems and the empowerment of local communities. Furthermore, the pathways resonate with the **Nagoya Protocol's** focus on equitable access and benefit-sharing, emphasising the respect for indigenous rights and community-based management of genetic resources.
In relation to the **Sustainable Development Goals (SDGs)**, the pathways align with **SDG 2**, on ensuring genetic diversity and promoting sustainable agriculture, as well as **SDG 5**, which focuses on promoting gender equality and empowerment in agriculture. Additionally, the emphasis on sustainability and support for local seed networks is consistent with **SDG 12**, which promotes sustainable consumption and production patterns.

Policy gaps and policy recommendations to facilitate the EU and global transformative pathways

- **Harmonisation across EU states**: some regional disparities regarding seed laws exist within EU member states. Policies need to ensure harmonised regulations to support informal seed systems across different jurisdictions, overcoming variations in support or prohibitions of diverse seed exchange. This would promote a more integrated, efficient and resilient agricultural system across EU, advantageous to various stakeholders and the environment.
  Specific suggestion (policy recommendation): implement EU-wide seed legislation that standardises regulations concerning the exchange and conservation of diverse seed varieties. This could involve developing a framework that supports informal seed systems, ensuring that all member states adopt consistent standards for seed-saving, trading, and breeding. Such harmonisation would facilitate a more integrated approach, empowering small-scale farmers and community seed networks across the EU.

- **Enhancement of the EU Common Agricultural Policy**: the Common Agricultural Policy is a central policy instrument for governing food, the

environment, and the countryside in the EU. Whilst the current Common Agricultural Policy 2023 – 2027 provides some requirement and incentive for biodiversity-friendly farming practices, such as agrobiodiversity, on agricultural land, introducing more focused incentives and requirements to promote and support biodiversity-friendly farming could significantly strengthen the role of the Common Agricultural Policy in fostering sustainable practices.
Specific suggestion (policy recommendation): include targeted incentives within the CAP to promote biodiversity-friendly practices. This could mean expanding eco-schemes to provide additional financial support for practices like agroforestry and organic farming. Specifically, the CAP could introduce performance-based incentives for farmers who actively maintain or improve biodiversity on their lands. Amendments could also require member states to allocate a portion of CAP funds exclusively for biodiversity-enhancing projects.

- **Stronger international cooperation and support**: while there are currently promising frameworks like the Nagoya Protocol, effective implementation requires enhanced international cooperation. This cooperation is vital for ensuring that countries adhere to these agreements, share best practices, and provide the necessary resources for successful execution. Establishing more robust measures for compliance and support will allow nations to collectively work towards the goals outlined in the global pathway, thereby enhancing biodiversity conservation and equitable resource management.
  Specific suggestion (policy recommendation): create mechanisms for regular knowledge exchange and workshops under the auspices of international agreements such as the Nagoya Protocol. This could include commitments to bi-annual reviews of member states' progress in biodiversity and resource management, backed by technical and financial support from an international fund dedicated to these purposes

- **Targeted gender-empowerment policies**: while gender equality is acknowledged in various frameworks, the introduction of specific policies aimed at empowering women within seed systems and agricultural decision-making processes is recommended. This could involve enhancing gender equality provisions within the CAP, ensuring that funding and support mechanisms specifically target women farmers and promote their participation in agriculture. Additionally, implementing policies that facilitate women's access to resources - such as training, land rights, and decision-making roles - would strengthen global alignment with SDG 5 and Target 23 of the Kunming-Montreal Global Biodiversity Framework.
  Specific suggestion (policy recommendation): develop CAP provisions that specifically allocate funds and resources to support women in agriculture. This could include creating programs that ensure women farmers have access to key agricultural resources and decision-making positions. Integrating these measures would support alignment with SDG 5 and enhance gender equity in agricultural systems.

4.7.2. Transformative Pathways for System Change in Trade and Global Value Chains

Overall, the proposed transformative pathways present a comprehensive approach that intersects effectively with existing policies on EU and global level. Some gaps were identified that might leverage additional support for transformative change. The pathways advocate for sustainable practices that resonate with both EU and global biodiversity goals, while concurrently identifying potential policy gaps to address for sustainability in this sector. They also underscore the importance of stakeholder engagement and the operationalisation of complex frameworks into manageable actions, paving the way for effective and impactful implementation.

Alignment of proposed transformative pathways with existing EU and global policies

EU-Level Pathway Alignment:

The proposed pathway prioritises agroecological practices, aligning with the **Common Agricultural Policy 2023 - 2027**, particularly its focus on environmental issues. By emphasising the sharing of commodity origination, it enhances transparency, a key aspect highlighted in the **EU Biodiversity Strategy 2030**. The strategy underscores the importance of community engagement and the promotion of sustainable practices, reinforcing the need for a whole-of-society approach. Additionally, compliance with the EU **Deforestation Regulation** is crucial for the pathway's success, as it directly relates to efforts to prevent deforestation within supply chains. **The Corporate Sustainability Due Diligence Directive** further complements this pathway by emphasising corporate accountability for negative impacts on biodiversity, thereby supporting the transparency and sustainability objectives in sourcing. Moreover, the **Farm to Fork Strategy** resonates with the pathway's advocacy for sustainable consumption, particularly in reducing dependence on unsustainable feed materials, such as soy sourced from deforested areas. Together, these elements create a cohesive framework for promoting sustainability and biodiversity in agriculture.

Global-Level Pathway Alignment:

The pathways support key targets of **Kunming-Montreal Global Biodiversity Framework**, such as: Target 1 (reducing biodiversity loss) through promoting sustainable practices and community involvement and Target 10 (enhancing biodiversity and sustainability in agriculture), which is directly aligned with the focus on agroecological transitions. Regarding the **Sustainable Development Goals (SDGs)**, the emphasis on sustainable agriculture (SDG 2) and sustainable consumption practices (SDG 12) aligns directly with the goals set forth in the transformative pathway. Also Target 12.6, which encourages companies to adopt sustainable practices and report on them, is mirrored in the proposed pathway (transparent sourcing regulations).

Policy gaps and policy recommendations to facilitate the EU and global transformative pathways

While there are several areas of alignment, some notable gaps may be identified:

- **Broader Inclusion of SMEs**: current directives primarily target large corporations, which can inadvertently overlook small and medium-sized enterprises (SMEs). New policies could extend responsibilities for biodiversity and environmental stewardship to SMEs, thereby enhancing their ability to adopt sustainable practices.
  Specific suggestion (policy recommendation): develop EU directives that extend environmental and biodiversity stewardship responsibilities to SMEs. This could involve creating tiered compliance requirements based on company size, offering incentives such as tax breaks or grants to SMEs that adopt sustainable practices, and ensuring access to resources and training needed for implementing these practices.

- **Standardisation of data platforms**: although data-sharing mechanisms are suggested, the absence of standardised platforms for environmental impact data across nations presents a significant gap. Policy amendments could mandate the implementation of such standards to facilitate effective data sharing.
  Specific suggestion (policy recommendation): establish an EU-wide mandate for the creation of a standardised environmental impact data platform across member states to improve data sharing and transparency. This platform should integrate with existing international databases and encourage cross-border cooperation in monitoring and reporting environmental impacts, particularly in soy and beef supply chains. This mandate could be supported by the European Environmental Agency and align with broader EU digital strategy initiatives

- **Integration with indigenous rights**: the proposed pathways could greatly benefit from a stronger and more explicit focus on the rights and roles of indigenous peoples within both EU and global frameworks, particularly regarding the implementation of sustainable practices. Enhancing this integration would support a more inclusive approach to sustainability.
  Specific suggestion (policy recommendation): proposed pathways could greatly benefit from a stronger focus on indigenous rights within EU and global frameworks. Policies should explicitly protect indigenous land rights in trade agreements and support collaborations that incorporate indigenous knowledge in sustainable practices

4.7.3. Transformative pathways for institutional systems change in the fashion sector

The proposed transformative pathways for the fashion sector demonstrate strong alignment with both EU and global policies focused on sustainability, biodiversity, and circular economy transitions. However, addressing existing gaps such as detailed actions on overproduction, support for SMEs, and enhanced international standards for sustainable materials could further strengthen the implementation and impact of these pathways across the sector.

Alignment of proposed transformative pathways with existing EU and global policies

EU-Level Pathway Alignment:

The **EU Biodiversity Strategy for 2030** aligns with the pathway's focus on reducing deforestation and agrochemicals, supporting the strategy's goals to minimise harmful substances and promote agro-ecological practices. Similarly, the **EU Circular Economy Action Plan** is complemented by the pathway's promotion of circular economy models, particularly its emphasis on sustainable production and consumption as highlighted in Section 3.5. This focus, especially on the textiles sector, assists in transitioning toward a sustainable economy by targeting sectors with high circularity potential. Moreover, the **EU Strategy for Sustainable and Circular Textiles** finds alignment in the proposed actions, such as life cycle disclosure, consumer awareness, and addressing the cycles of overproduction and consumption. Finally, the pathway's emphasis on transparency, reporting, and sustainability practices aligns well with the **Corporate Sustainability Reporting Directive** and the Corporate Sustainability **Due Diligence Directive**, both of which require companies to disclose their environmental impacts and practices.

Global-Level Pathway Alignment:

The **Kunming-Montreal Global Biodiversity Framework** aligns with the global pathway created through its emphasis on reducing material usage and integrating biodiversity considerations throughout fashion value chains, corresponding with Targets aimed at reducing pollution and enhancing biodiversity in production practices. In addition, the **Sustainable Development Goals** are pertinent to these pathways, particularly **SDG 12** (Responsible Consumption and Production), which is closely associated with the focus on waste reduction, fostering sustainable practices, and educating consumers about sustainable lifestyles. **SDG 6** (Water Management) also aligns with the pathways' objectives by ensuring sustainable water use in production processes.

Policy gaps and policy recommendations to facilitate the EU and global transformative pathways

- **Extended focus on overproduction and consumption**: the need for explicit and strong actions to curb overproduction and consumption remains a gap. New policies could introduce regulatory mechanisms similar to alcohol and tobacco regulations aimed at planetary health.
  Specific suggestion (policy recommendation): develop EU regulations akin to existing public health policies (e.g., those for alcohol and tobacco) to address fashion overproduction and consumption. These could include implementing "fashion caps" or limits on the volume of fast fashion imports, introducing taxation on excess production to discourage overproduction, with revenues reinvested in sustainable fashion initiatives, prohibiting misleading marketing practices, such as by enforcing strict guidelines on environmental claims in fashion marketing to the Green Claims Directive.

- **Supplying incentives for SMEs**: existing regulatory frameworks tend to focus on larger corporations, leaving smaller enterprises less regulated. Policy amendments could include support and requirements tailored to SMEs to enhance their participation in sustainable practices.
  Specific suggestion (policy recommendation): amend the Common Agricultural Policy (CAP) and EU Circular Economy Action Plan to include specific provisions for supporting SMEs in the fashion sector by providing subsidies and tax breaks for SMEs that adopt verifiable sustainable practices and establishing dedicated grant programs for innovation in sustainable materials and processes aimed at SMEs.

- **Stronger enforcement of greenwashing regulations**: the increasing issue of greenwashing calls for more robust policy measures to ensure transparency and accountability in marketing claims, protecting consumers and promoting genuine sustainability.
  Specific suggestion (policy recommendation): strengthen the EU Eco-label and Green Claims Directive to ensure compliance with truthful marketing of sustainability claims by establishing an independent oversight committee for reviewing and certifying environmental claims in fashion advertising and by enforcing penalties for non-compliance.

- **International standards for sustainable materials**: establishing harmonised standards and engaging in international trade agreements focusing explicitly on sustainable material regulations could fill existing gaps, supporting the transition to eco-friendly textiles.
  Specific suggestion (policy recommendation): advocate for the development of EU-facilitated global standards for sustainable materials, to be included in international trade agreements by collaborating with international standards organisations, such as ISO, to create comprehensive guidelines for sustainable material use in fashion. Prioritising agroecological and biodegradable materials.

4.7.4. Transformative pathways for students' nature relatedness in Hungarian public schools

Transformative pathways for enhancing nature relatedness in education demonstrate strong alignment with existing EU and global policies, particularly in supporting sustainability and environmental stewardship. By addressing identified gaps through more cohesive and targeted policy frameworks, the impact of these pathways can be significantly amplified, leading to a more robust and integrated approach to sustainability-related education. This alignment and potential policy enhancements will ensure that learners across Europe and globally are better equipped to become active contributors to sustainability and biodiversity goals.

Alignment of proposed transformative pathways with existing EU and global policies

EU-Level Pathway Alignment:

The EU Biodiversity Strategy for 2030 aligns with the pathways' focus on integrating biodiversity education into national curricula and fostering nature-related experiential learning, which supports the strategy's push for educational improvements related to biodiversity and ecosystems. Similarly, the **Council recommendation on learning for the green transition and sustainable development (2022)** resonates with the pathways' emphasis on experiential, cross-curricular, and practical learning methods, aligning with the recommendations for incorporating sustainability into education systems. The **European Pillar of Social Rights Action Plan 2030** also aligns with the pathways by emphasising a commitment to lifelong learning and equitable education, which fosters sustainable citizenship and environmental stewardship in various educational settings.

Global-Level Pathway Alignment:

The Kunming-Montreal Global Biodiversity Framework supports the global pathway's aim to enhance nature-related experiential learning, aligning with **Target 21**, which focuses on making knowledge available to guide biodiversity action. In relation to the **Sustainable Development Goals (SDGs)**, the pathways directly support **SDG 4** (Quality Education), particularly **Target 4.7**, by equipping learners with the knowledge and skills necessary for sustainable development and environmental stewardship.

Policy gaps and policy recommendations to facilitate the EU and global transformative pathways

- **EU-level harmonisation of nature-based education**: although education policy falls under member states' jurisdiction, there could be more concrete EU-wide incentives or frameworks to encourage the adoption of best practices and integration of nature-based education uniformly across countries.

Specific suggestion (policy recommendation): establish an EU Framework for Nature-Based Education (an EU-wide policy framework that encourages and incentivises member states to adopt best practices in nature-related education). This framework could include guidelines for integrating nature-based learning into national curricula, along with resources for training educators in experiential learning methods. Also, allocation of funding through EU programmes (e.g., Erasmus+) specifically aimed at supporting the implementation of nature-based educational initiatives across member states would be beneficial.

- **Targeted funding and support mechanisms**: while there are funding streams available, more targeted funding specifically for implementing nature-related experiential learning modules could help standardise and spread successful pilot projects across all member states.
  Specific suggestion (policy recommendation): create Dedicated Funding Streams for Nature-Based Education within the EU's educational funding to support nature-related experiential learning initiatives. This funding should be aligned with the EU Biodiversity Strategy for 2030 and the European Green Deal, emphasising their role in fostering sustainability in education.

- **Global coordination for knowledge sharing**: developing a robust global network that facilitates the sharing of best practices and research findings could be formalised through policy initiatives that focus on international cooperation within educational contexts.
  Specific suggestion (policy recommendations): encourage joint research initiatives that explore the impacts of nature-based education on biodiversity awareness and environmental behaviours, involving multiple stakeholders from across the globe.

- **Enhanced integration with broad SDG goals**: while the pathways support specific targets within broader SDG goals, policy development could focus on more directly linking educational initiatives to broader sustainability and climate action goals, ensuring a comprehensive approach to fostering global environmental citizenship.
  Specific suggestion (policy recommendation): create policy mechanisms to align nature-based education with SDGs: develop policy tools that explicitly connect nature-related education initiatives to the broader SDGs, particularly SDG 4 (Quality Education) and SDG 13 (Climate Action).

4.7.5. Transformative pathways for system change in sustainable finance sector

The proposed transformative pathways for sustainable investment in the financial sector align well with existing EU and global policies focused on biodiversity,

sustainability, and corporate accountability. Addressing the identified gaps, such as standardising biodiversity metrics, including SMEs in initiatives, and offering incentives for biodiversity-positive investments, could further enhance the effectiveness of these pathways, promoting a more sustainable financial landscape that prioritises biodiversity conservation.

Alignment of proposed transformative pathways with existing EU and global policies

EU-level pathway alignment:

The EU Biodiversity Strategy for 2030 emphasises the importance of improving biodiversity metrics and integrating them into financial decision-making, aligning with the strategy's commitment to ensure the sustainability of the financial system and promote investments in biodiversity. Likewise, **the Sustainable Finance Disclosure Regulation (SFDR)** directly supports the pathways' focus on enhancing transparency in biodiversity reporting, aiming to reduce greenwashing and promote sustainable investments by requiring financial institutions to disclose ESG considerations. **The Corporate Sustainability Reporting Directive (CSRD)** further complements this effort by advocating for standardised biodiversity metrics in financial reporting, which aligns with the CSRD's requirement for companies to disclose their environmental impacts, thereby promoting the inclusion of biodiversity in corporate accountability. Additionally, the pathways' call for stronger regulatory frameworks aligns with the **Corporate Sustainability Due Diligence Directive (CSDDD**), which mandates companies to identify and mitigate adverse environmental impacts, including those associated with biodiversity.

Global-level pathway alignment:

The global pathway's goal to establish standardised biodiversity assessment frameworks resonates with the **Kunming-Montreal Global Biodiversity Framework**, supporting **Targets 14 and 15**, which emphasise the integration of biodiversity into decision-making and require businesses to assess and disclose biodiversity-related risks. Furthermore, the focus on sustainable finance and mobilising resources for biodiversity aligns with the **Sustainable Development Goals (SDGs),** particularly **SDG 8 and Target 8.4**, which aim to improve resource efficiency and decouple economic growth from environmental degradation.

Policy gaps and policy recommendations to facilitate the EU and global transformative pathways

- **Standardisation of biodiversity metrics**: while the pathways identify the need for standardised biodiversity assessment frameworks, there is a gap in existing policies mandating the development and adoption of these metrics across all EU member states. New policies could be introduced to facilitate this standardisation process to ensure consistency and comparability in reporting.

Specific suggestion (policy recommendation): EU Regulation on biodiversity metrics: introduce an EU regulation mandating the development and adoption of standardised biodiversity assessment frameworks across all member states. This regulation could require all companies to report using a unified set of biodiversity metrics and provide guidance on implementation.

- **Inclusion of private sector participation**: the current regulations primarily focus on larger corporations and financial institutions. New policies could encourage the involvement of small and medium-sized enterprises (SMEs) in adopting biodiversity metrics, ensuring that sustainable investment practices are widespread across the entire financial sector.
  Specific suggestion (policy recommendation): recommend amendments to the CAP that create dedicated support programmes for SMEs to adopt biodiversity metrics, including funding and training initiatives

- **Enhanced collaboration with non-financial sectors**: there is an opportunity to develop policies that promote collaboration between the financial sector and other industries (such as agriculture and energy) to create joint initiatives aimed at achieving biodiversity goals. This cross-sectoral approach could lead to more comprehensive investment strategies that prioritise sustainability.
  Specific suggestion (policy recommendation): cross-sectoral policy frameworks: develop policy frameworks that promote partnerships between the financial sector and non-financial sectors such as energy. This could include establishing inter-sectoral working groups to align goals and create joint initiatives focused on biodiversity.

- **Incentives for biodiversity-positive investments**: existing frameworks outline obligations for businesses regarding sustainability. However, there is a lack of specific incentives designed to encourage investments in biodiversity-positive projects. Introducing tax benefits or grants for financial institutions and businesses investing in biodiversity conservation could promote this alignment more effectively.
  Specific suggestion (policy recommendation): introduce tax benefits and grants specifically targeted at financial institutions and businesses that invest in biodiversity-positive projects. This could be structured through a biodiversity investment fund that offers financial rewards for companies demonstrating significant contributions to biodiversity conservation

4.7.6. Transformative pathways for system change in agriculture sector (with a focus on agricultural labour shortages, migration patterns, and biodiversity-friendly farming practices)

The proposed transformative pathways for enhancing biodiversity and addressing labour shortages in agriculture are strongly aligned with existing EU and global policies aimed at promoting sustainability and social equity. Addressing the identified gaps, such as establishing explicit biodiversity metrics in the Common Agricultural Policy, protecting migrant workers, securing funding for training, and enhancing international cooperation, could further strengthen the effectiveness of these pathways.

Alignment of proposed transformative pathways with existing EU and global policies

EU-level pathway alignment:

The EU Biodiversity Strategy for 2030 emphasises biodiversity-friendly practices within the **Common Agricultural Policy 2023 - 2027**, aligning directly with the strategy's goal of enhancing agro-ecological practices and ensuring that agricultural land incorporates high-biodiversity landscape features. The proposed revision of CAP subsidies to incentivise sustainable practices and fair labour conditions aligns well with CAP reforms that aim to support sustainable and equitable agricultural practices. Additionally, the focus on addressing labour conditions and promoting fair treatment of agricultural workers corresponds to the **Farm to Fork Strategy's** commitment to ensuring social protections and equitable treatment throughout the food chain. Furthermore, the training programmes aimed at empowering both farmers and migrant workers with knowledge of their rights and sustainable practices align with the principles of equal opportunities, lifelong learning, and fair pay set out in **the European Pillar of Social Rights Action Plan 2030.**

Global-Level Pathway Alignment:

In the global context, the goal to support sustainable agricultural practices, enhance biodiversity, and ensure equitable labour conditions links directly to **Target 10** of the **Kunming-Montreal Global Biodiversity Framework**, which focuses on enhancing biodiversity and sustainability in agriculture. Additionally, the pathways align with **SDG 10**, which aims to reduce inequalities, and **SDG 15**, which promotes the sustainable use and conservation of terrestrial ecosystems. This highlights the importance of integrating biodiversity considerations into agricultural practices while ensuring social equity in labour conditions.

Policy gaps and policy recommendations to facilitate the EU and global transformative pathways

- **More explicit biodiversity metrics in Common Agricultural Policy reforms**: while there is momentum toward integrating biodiversity metrics into the Common Agricultural Policy, regulations could be strengthened by establishing clear metrics and assurances that quantitatively assess impacts on biodiversity and labour conditions concurrently.
  Specific suggestion (policy recommendation): amend the CAP to explicitly require the incorporation of standardised biodiversity metrics across all member

states. This could involve establishing a regulatory framework that defines specific biodiversity indicators to assess the impact of agricultural practices on both biodiversity and labour conditions. The regulation should ensure that these metrics are consistently applied, enabling robust evaluation and reporting that informs future policy adjustments

- **Broader inclusion of migrant worker protections**: although the guidelines benefit labour conditions, there is still a gap in effectively translating these frameworks into practice. New policies could enhance protections specifically for migrant agricultural workers, ensuring that they receive the same rights and social protections regardless of their status.
  Specific suggestion (policy recommendation): integrate explicit worker protection provisions within the CAP, ensuring equal rights and treatment for migrant agricultural workers

- **Funding initiatives for training programmes**: while training programmes are proposed, there could be more focused policies aimed at securing funding for these initiatives to ensure widespread access, especially in regions facing acute labour shortages.
  Specific suggestion (policy recommendation): create specific EU funding programmes designed to support the development and implementation of training initiatives focused on biodiversity-friendly practices for both farmers and migrant agricultural workers. This funding should be accessible to local governments, NGOs, and training institutions to ensure widespread access.

- **Enhanced international cooperation on sustainable practices**: policies promoting collaboration with other countries and international organisations could improve knowledge sharing and capacity building in sustainable agricultural practices that prioritise both biodiversity conservation and fair labour standards.
  Specific suggestion (policy recommendation): develop a formal policy framework for international cooperation in sustainable agriculture, facilitating resource-sharing and best practice exchanges through partnerships with international organisations

5 Discussion of findings

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In examining the transformative pathways towards sustainability and transformative change across multiple sectors (agriculture, trade, fashion, education, and finance) the analysis reveals both commonalities and distinctions in approaches to enablers and barriers. By exploring key themes such as sustainability integration, policy advocacy, community engagement, and international collaboration, this discussion reveals how

different sectors navigate similar challenges while employing unique strategies tailored to their specific contexts. Understanding these similarities and differences is essential for identifying (un)common effective enablers and barriers that shape the success of transformative change across different contexts.

5.1 Similarities and differences across sectoral pathways

The analysis of pathways explored the similarities and differences across several sectoral pathways, focusing on sustainability, policy advocacy, community engagement, and global collaboration. Despite their distinct challenges, all sectoral pathways demonstrate a firm commitment to integrating biodiversity and sustainability into their core practices. However, differences are evident in the scope and nature of interventions, with agriculture focusing on tangible practices, whereas investment emphasises data-driven approaches. Pathways also vary in their immediate versus long-term goals, stakeholder influences, and levels of technological integration, thereby shaping distinct pathways in their pursuit of sustainability.

Similarities across sectoral pathways

Focus on sustainability
A sustained commitment to integrating sustainability as a core principle is apparent across all sectoral pathways. For example, the agricultural sector emphasises biodiversity-friendly farming and sustainable land management, aligning with the EU Biodiversity Strategy for 2030. Similarly, the fashion pathway aims to phase out synthetic materials and reduce raw material usage, promoting circularity and minimising ecological impact. Finance sector is increasingly integrating biodiversity metrics into the decision-making processes, mirroring the sustainability focus present on agriculture and education by promoting environment-friendly policies and practices.

Policy advocacy and regulatory changes
Across case studies, there is a common reliance on policy and regulatory frameworks to drive change. For example, the agriculture case study and trade case study are looking to reform existing policies like the Common Agricultural Policy and trade agreements to support sustainable practices. Both cases focus significantly on policy reforms to drive systemic change. The reform of the Common Agricultural Policy is highlighted as a key intervention in agriculture to promote biodiversity-friendly practices. Likewise, trade pathways emphasise reforming this policy to include agroecological practices and enhance supply chain transparency.

Community engagement and empowerment
Empowering local actors is central across various cases. Agriculture, education, and fashion cases focus on empowering local communities and stakeholders. This involves promoting grassroots movements, enhancing local capacities, and ensuring that

community voices are integrated into decision-making processes. The agrobiodiversity case supports community seed networks and advocates for local farming practices. In the education case study, there is an emphasis on experiential learning that involves local community participation and partnerships to enhance environmental stewardship.

Global collaboration and knowledge sharing

There is a common focus on global learning and collaboration to overcome sector-specific barriers. Sectoral pathways in case studies education and investment are fostering global networks to harmonise efforts and share innovative practices. For instance, the education sectoral pathway is working towards integrating nature-related experiential learning across diverse cultural and regulatory contexts, which requires extensive international cooperation to develop adaptable curricula and teaching methodologies. The education pathway emphasises the importance of global partnerships to disseminate pedagogical innovations and experiential learning strategies that promote environmental stewardship. Similarly, the finance sectoral pathway aims to create standardised frameworks and metrics for biodiversity, seeking alignment across international financial institutions to ensure consistent sustainability reporting and decision-making. Likewise, the fashion sectoral pathway advocates for the creation of an international platform to share knowledge and relevant information on various aspects of fashion and biodiversity.

Differences across sectoral pathways

Scope and nature of interventions

The agricultural sector’s pathways are deeply entrenched in transforming physical practices (e.g., biodiversity-friendly farming), whereas the finance sector's pathway focuses on integrating intangible metrics and data-driven approaches to influence financial decisions. Fashion industry pathways largely revolve around shifting consumer behaviour and promoting sustainable business models, contrasting with the educational sector’s pathway approach, which seeks systemic curricular changes to enhance nature-relatedness among students.

Immediate versus long-term goals

Sectoral pathway in trade and finance cases seek immediate policy changes and regulatory integrations. In contrast, the education sectoral pathway's transformative goals are more long-term, focusing on gradually embedding sustainability into educational systems and fostering an environmentally conscious generation.

Stakeholder influence

While all sectoral pathways involve multiple stakeholders, their influence varies. In agriculture case study (agrobiodiversity case), small-scale farmers and local communities play a central role, whereas in finance case, the shift towards sustainability relies heavily on regulatory bodies and large financial institutions. In the education sectoral pathway, stakeholders include policymakers, educators, and

national education bodies working towards curricular integration. Contrastingly, the trade sectoral pathway involves collaboration between agricultural producers and international regulators to facilitate sustainable commodity sourcing practices.

Technological integration
The degree of technological integration varies, with sectoral pathways like finance utilising advanced metrics and data analytics, while pathways such as fashion are exploring innovative materials and sustainable production technologies. The finance sector pathway leverages technological tools to improve nature risk screening tools for financial analysts, thus incorporating biodiversity into financial decisions. This is different from the fashion sectoral pathway, which involves redesigning textiles and materials to support sustainability but relies less on digital or analytical tools.

5.2 Enabling and disabling factors for transformative change

The success of transformative interventions across various sectors, particularly in agriculture, trade, and education, depends on a complex interplay of enabling and disabling factors that influence their implementation and outcomes. Understanding these conditions is vital for designing effective strategies that can promote biodiversity, sustainability, and equity. Moreover, there are several critical enabling factors that are universally applicable across the case studies. This section discusses the enabling and disabling factors identified for transformative change within the sectors. It also highlights factors that are uniquely tailored to meet challenges within specific sectors and those that are common across these sectors

Enabling Factors

Intersectional lens for identifying interventions
The importance of applying an intersectional lens to identifying interventions cannot be overstated, as it is crucial for achieving just transformative change across the sectors examined. By considering the interconnectedness of social identities -including but not limited to, gender, ethnicity, socioeconomic status, and migration status - we can better understand how these factors influence individuals' experiences with sustainability initiatives and environmental policies. When developing policies and interventions, acknowledging these intersectional dimensions helps ensure that the needs and voices of the most marginalised populations are not overlooked.

Supportive legal and policy frameworks
A coherent and enabling legal environment is essential for the success of transformative interventions across the various sectors. However, it is important to recognise that these frameworks are not static; they must evolve as part of the transformative pathways themselves. While existing supportive policies provide a

foundation for sustainable practices, effective transformation often requires advocating for reforms to legal and policy frameworks that currently hinder progress. Thus, the goal of developing supportive legal frameworks can be seen as both an enabler of transformation and an outcome of the pathways pursued. This dual role underscores the need for continuous dialogue and engagement with policymakers to align legal structures with emerging sustainability goals. An analysis of the sectors under study reveals that strong policies such as the EU Biodiversity Strategy for 2030 and the Common Agricultural Policy create a supportive framework for sustainable practices.
In the agricultural sector, particularly for initiatives like the establishment of regional seed hubs, legislative frameworks (such as the EU Seed Law) are crucial. These regulations aim to create a favourable policy landscape that supports local seed systems by ensuring the rights of small-scale farmers and community seed networks are protected—allowing practices such as seed-saving, breeding, and exchange without the restrictive pressures of formal seed regulations.

In the trade sector, supportive policies are equally critical. Future reforms of the Common Agricultural Policy can provide the legal basis to promote sustainable practices, emphasising transparency and public accountability in commodity sourcing. Consistent advocacy for policy reforms helps reinforce initiatives aimed at promoting agrobiodiversity and environmental sustainability. Specifically, pushing for regulations that require transparency from companies that source soy and beef can help create a legal framework conducive to sustainable trading practices while protecting biodiversity. This transparency ensures accountability among corporations sourcing agricultural products, aligning trade practices with sustainability goals and supporting effective environmental governance.

This is vital in ensuring that trade agreements align with environmental and social equity goals, as discussed in the global-level transformational pathways. Similarly, in the fashion sector, implementing legally binding regulations around supply chain transparency and sustainability is necessary to account for environmental impacts. Policies that mandate companies to disclose sourcing information and adhere to environmental standards can help mitigate harm to biodiversity while promoting ethical practices within the industry. Legal frameworks that emphasise corporate accountability can empower consumers and communities, leading to increased support for sustainable business models. In the education sector, the integration of nature-related experiential learning into curricula can be supported through government policy, ensuring that educational institutions receive adequate funding and resources. The emphasis on implementing nature-related experiential learning within educational curricula highlights an enabling factor that is specific to the education sector. This approach fosters a culture of environmental stewardship among students, ensuring future generations are equipped with the understanding necessary to advocate for sustainability.

Additionally, the promotion of international collaboration and knowledge sharing between educational organisations enhances the legal and operational frameworks available for implementing nature-based education across various contexts.

Financial resources and incentives

Access to financial support is crucial for implementing sustainable practices across all sectors. In the agricultural sector, financial initiatives aimed at smallholder farmers are essential for facilitating the transition to biodiverse-friendly farming methods. For example, as the agrobiodiversity case suggests, funding for on-farm experiments and community seed exchanges empowers local stakeholders, promoting their engagement in informal seed systems that contribute to agrobiodiversity. Similarly, establishing financial mechanisms that align with the EU Biodiversity Strategy for 2030 not only enhances the effectiveness of agricultural interventions but also ensures that social equity considerations are integrated into funding approaches. In the trade sector, financial support is vital for developing transparent sourcing practices, enabling companies to implement sustainable supply chain solutions. Funding can be directed towards initiatives that promote transparency in commodity production, particularly in soy and beef supply chains, where greater investments in sustainable practices can help mitigate negative environmental impacts. In the fashion sector, funding for research into sustainable materials and technologies is crucial for fostering a circular economy. The focus on encouraging circular economy practices in the fashion industry, including recycling and eco-design, represents a distinctive enabling factor. Financial incentives tailored towards supporting businesses adopting these models are crucial for transforming production and consumption patterns within the sector. Financial incentives, such as grants and subsidies for businesses adopting eco-design and recycling efforts, can drive innovation and support the transition towards more sustainable production models. These incentives can also extend to educational programmes focused on sustainable consumption, helping raise consumer awareness about the ecological footprint of their choices. In the education sector, financial resources play a key role in integrating nature-related experiential learning into curricula. Investments in training programmes for educators and the development of outdoor learning environments can significantly enhance the capacity of educational institutions to foster environmental stewardship among students. Access to funding ensures that schools are equipped to implement programmes like school gardens and community projects that connect students with local ecosystems. Creating funding mechanisms for biodiversity-focused financial initiatives in finance sector is essential. By promoting the integration of biodiversity metrics into investment decision-making, financial institutions can provide the resources necessary for projects that prioritise environmental responsibility.

Community empowerment and engagement

Community empowerment and engagement play a fundamental role in the success of sustainability initiatives across various sectors. By actively involving local communities in decision-making processes, stakeholders can harness the collective knowledge and experiences of those directly impacted by environmental policies and practices. The

establishment and acknowledgment of community seed networks are particularly emphasised as a unique enabling factor in the agricultural case study. These networks foster cooperation and knowledge-sharing specifically tailored for enhancing agrobiodiversity through local seed initiatives. Moreover,the focus on community-led efforts, particularly within informal seed systems and education, underscores the importance of fostering cooperation and knowledge sharing to enhance biodiversity conservation. This approach strengthens local ecosystems and also cultivates a sense of ownership and responsibility among community members, paving the way for long-term environmental stewardship. The analysis also highlighted the necessity for cross-sectoral collaboration, wherein local communities actively participate in the development of policies that influence their environments. Engaging appropriately with grassroots organisations such as civil society organisations, NGOs, and community groups is a recurring enabler across all case studies. These organisations play a crucial role in advocating for sustainable agriculture, promoting community seed networks, and facilitating knowledge sharing. Their grassroots-level involvement fosters community engagement and local empowerment enhancing the capacity of communities to voice their concerns, contribute to policy discussions, and support local conservation efforts. By creating networks that facilitate the exchange of best practices and relevant knowledge, communities can learn from one another, thereby reinforcing their ability to manage biodiversity effectively in the face of external pressures like industrial agriculture and climate change.

International collaboration and knowledge sharing

Global networks that facilitate information exchange and collaborative efforts among stakeholders are crucial for strengthening the implementation of biodiversity-friendly practices. This is identified as a common enabler across the sectors. By fostering connections between various sectors, such as agriculture, trade, fashion, and education, these networks enable and enhances the sharing of knowledge, innovative approaches, resources and strategies that have proven effective in diverse contexts. For instance, the establishment of platforms dedicated to sharing best practices across countries can play a pivotal role in aligning local initiatives with broader global sustainability goals thus fostering resilience and adaptive capacity within communities. This alignment not only enhances the effectiveness of interventions but also promotes the mutual learning necessary for adapting successful strategies to fit specific regional challenges. Moreover, international collaboration can also amplify the voices of marginalised communities, ensuring they are heard in global discussions about sustainability and environmental governance. This inclusive approach allows for a richer dialogue around biodiversity, recognises the value of local knowledge, and promotes equitable benefit-sharing from natural resources. In this way, global networks not only empower local communities but also contribute to the development of more resilient and adaptive systems of biodiversity management.

Consumer awareness

Increasing consumer demand for sustainable and ethically produced goods is a common factor that bolsters efforts across all the sectors. As consumers become more aware of ecological impacts and prioritise sustainable practices, they drive market changes that benefit various initiatives, from sustainable agriculture to eco-friendly fashion.

Changing societal values toward nature and equity
An evolving appreciation for nature and social equity can significantly support the success of transformative interventions. As societal values shift away from traditional business-as-usual models towards increased recognition of environmental and social responsibilities, they can drive policy changes, consumer behaviours, and stakeholder engagement. For example, growing societal demands for sustainability and fairness empower movements that advocate for biodiversity conservation and equitable labour conditions. These changing values can enhance the acceptance of policies aimed at sustainability and drive collective action toward achieving transformative goals.

The interconnection of agriculture, migration, and biodiversity
Ensuring fair labour conditions within the EU particularly the agricultural system has a broader impact by promoting sustainability across social, environmental, and biodiversity dimensions. Fair wages and improved working conditions enhance worker well-being, ensuring a stable workforce that supports long-term sustainability

Standardisation of biodiversity metrics
The establishment of standardised biodiversity assessment frameworks across countries is a distinctive opportunity in the finance sector. This standardisation supports decision-making processes that prioritise biodiversity in financial practices, enhancing accountability and promoting sustainable investment behaviours.

Disabling Factors

Scaling challenges for some initiatives
Initiatives aimed at enhancing biodiversity often start at a local level and may struggle to scale effectively. While local initiatives can foster community engagement and tailor solutions to specific contexts, it is worth questioning whether all such initiatives need to begin at this level. In many cases, local approaches can offer valuable insights and innovations; however, scaling these efforts often requires broader support and coordination to influence regional or national policies.
Cross-sector collaboration is critical to overcoming these scaling challenges. By engaging multiple sectors - such as agriculture, education, finance, and civil society - initiatives can leverage resources, expertise, and support systems that extend beyond local boundaries. This collaboration can help create a more integrated approach that reinforces the effectiveness of local initiatives, making them more attractive for scaling. For example, partnerships with financial institutions can provide necessary funding, while educational organisations can help disseminate successful practices more widely. The report underscores the importance of cross-sector collaboration but

highlights that entrenched interests and resistance can complicate these efforts. For example, while community seed networks may operate successfully in specific regions, their capacity to influence broader policies or inspire similar initiatives elsewhere is often constrained by insufficient institutional support and weak connections to larger agricultural or environmental movements. This lack of backing can present significant scaling challenges. When local initiatives do not receive adequate support from institutional frameworks, they struggle to gain traction, ultimately limiting their ability to impact broader policies or secure necessary resources.

Data gaps and insufficient knowledge

The absence of reliable data on the impacts of specific farming practices on biodiversity can impede effective interventions. The document points out that without comprehensive systems for collecting and monitoring data on biodiversity indicators, stakeholders struggle to measure the benefits of sustainable practices. For example, a lack of research on the outcomes of on-farm biodiversity conservation initiatives can make it difficult for smallholder farmers to justify investments in new methods or technologies that enhance agrobiodiversity.

Economic constraints

Financial limitations can severely restrict the ability of small-scale farmers and local communities to invest in sustainable practices. For instance, in the agricultural sector, farmers may lack access to necessary funding to implement agroecological practices or to transition to organic farming. Without sufficient financial resources or incentives, such as grants for seed banks or small-scale breeding enterprises, stakeholders cannot embrace practices aligned with the EU Biodiversity Strategy for 2030, leading to continued reliance on less sustainable methods.

Inconsistent political will

Variability in political will among EU Member States can hinder effective policy implementation and reform. While some countries adopt supportive legislation that encourages community seed networks, other regions impose restrictive regulations that limit seed exchange. For example, the legal context in some EU Member States strictly limits the exchange of diverse seeds, complicating the establishment of regional seed hubs. This inconsistency creates disparities in how effectively local initiatives can thrive across the EU.

Resistance to lobbying that seeks to put profit before sustainability

Resistance from established corporations can pose significant barriers to implementing sustainable agricultural practices. For instance, large agribusinesses often lobby against legislation like the EU Seed Law, which aims to empower small-scale farmers and promote diverse seed movements. By protecting their interests in conventional seed production, these corporations may undermine efforts to support informal seed systems that are vital for biodiversity, as mentioned in the agricultural pathways of the document.

Entrenched business-as-usual values
Entrenched values rooted in business-as-usual practices present a substantial barrier to transformative change. Persistent prioritisation of short-term economic gains over long-term ecological and social well-being hinders efforts to implement sustainable practices. These values often manifest as resistance to change from both consumers and industries, impeding the widespread adoption of practices that focus on ecological preservation and social equity.

5.3 Interplay of enablers and barriers: insights from diverse sectors

The analysis also highlighted the interconnected nature of enablers and barriers within the context of sustainability initiatives and transformative change. Enablers, which facilitate the implementation of effective interventions, can become barriers when they are absent or insufficiently supported. This duality highlights the necessity for a comprehensive understanding of the mechanisms that drive or impede progress across various sectors. For instance, the availability of financial resources can empower smallholder farmers to adopt sustainable practices; however, the lack of such funding can severely restrict their ability to transition to biodiversity-friendly methods. Understanding how the presence of specific enablers can directly relate to barriers when they are lacking is crucial for developing comprehensive strategies that effectively promote transformative change. The following section delineates some relationships between specific enablers and their corresponding barriers.

Access to financial resources
Enabler: availability of funding mechanisms tailored to support smallholder farmers and community initiatives enhances the adoption of sustainable practices.
Barrier: the absence of financial support creates a significant barrier for farmers attempting to transition to biodiversity-friendly practices. Limited access to funding prevents the implementation of innovative agricultural methods and undermines community-led projects.

Supportive legal and policy frameworks
Enabler: effective legislation like the EU Seed Law provides legal protections for informal seed systems and encourages local seed exchanges.
Barrier: the absence or inconsistency of supportive legal frameworks, where certain Member States impose restrictive seed exchange regulations, acts as a barrier to community engagement and biodiversity conservation efforts.

Grassroots organisations and community engagement
Enabler: strong grassroots organisations and civil society participation foster local empowerment and drive advocacy for sustainable agricultural practices.
Barrier: when these organisations are absent or lack the necessary support, communities may struggle to engage in the decision-making processes, leading to missed opportunities for local sustainability initiatives.

Consumer awareness and demand
Enabler: increased consumer awareness of sustainability issues drives market demand for eco-friendly products, strengthening support for various initiatives.
Barrier: a lack of consumer awareness or understanding of sustainability impacts can inhibit demand, allowing unsustainable practices to persist and undermining efforts to promote environmentally friendly options in sectors like fashion and agriculture.

International collaboration and knowledge sharing
Enabler: the establishment of global networks that facilitate knowledge exchange enhances capacity-building efforts and promotes best practices across sectors.
Barrier: a lack of international collaboration can result in isolated efforts, where communities do not benefit from shared experiences or lessons learned, thus limiting their ability to implement effective sustainability practices.

6 Conclusion

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This report has provided an in-depth exploration of transformative pathways and leverage points across five critical sectors: agriculture, trade, fashion, education, and finance. Through the systematic mapping and analysis of these areas, several common themes have emerged, alongside unique characteristics that highlight the context-specific nature of transformative change.

Across all sectors, there exists a shared commitment to embedding sustainability within their operational frameworks. Whether through enhancing biodiversity in agriculture, promoting circular economies in fashion, or integrating biodiversity metrics in finance, sectors are united in their goal to prioritise ecological health alongside economic viability. Each sector recognises the necessity for robust policy frameworks to instigate and sustain transformative change. Initiatives like the EU Biodiversity Strategy for 2030 and the Common Agricultural Policy serve as foundational instruments that facilitate sector-specific interventions, highlighting the importance of coherent regulatory environments. The analysis emphasised the critical role of community engagement in facilitating transformative change, recognising their potential to drive meaningful progress. As societal values shift towards a greater appreciation for nature and social equity, these changes can enhance the acceptance of sustainability policies and empower movements advocating for biodiversity conservation. At the same time, it identified significant obstacles, such as financial constraints that limit resource availability, and resistance from established interests invested in maintaining the status quo, which pose challenges to implementing these changes effectively.

To ground the transformative pathways in empirical evidence, we draw upon insights from our case studies. For instance, the Tuscan fashion industry case highlighted the importance of community engagement in promoting sustainable practices. Stakeholder discussions underscored the efficacy of collaboration and transparency in fostering consumer demand for biodiversity-friendly products. Subsequently, we recommend implementing collaborative platforms for producers that leverage these strategies, thus driving demand while promoting biodiversity. Similarly, the agriculture case study highlighted the intertwined nature of labour conditions and biodiversity outcomes. This insight leads us to advocate for targeted policy changes that enhance labour conditions while incentivising sustainable practices, fostering both workforce resilience and biodiversity conservation. By linking pathways to the evidence base developed in the project, we demonstrate the relevance and practicality of our transformative pathways in addressing pressing global challenges.

While commonalities exist, each sector has distinct strategies tailored to their unique challenges. For instance, agriculture emphasises tangible practices like biodiversity-friendly farming, finance focuses more on integrating data and metrics into investment decisions. This distinction illustrates the various nature of sustainable transformations across different areas. Also, the degree to which stakeholders influence processes varies. In agriculture, smallholders have substantial influence, while finance is primarily driven by large institutional investors. Education transforms through the integration of nature-related learning, engaging both policymakers and educators in formulating curricula. Sectors like finance and trade increasingly leverage technology to bolster sustainability, using advanced metrics and data analytics tools. In contrast, agriculture often looks to traditional practices and community networks to maintain biodiversity, showcasing the varying means by which sectors aim to achieve their goals.

The insights gathered from this report can significantly inform ongoing and future initiatives aimed at promoting transformative change across sectors. Key recommendations include:

i) creating cohesive policies that intersect between sectors, fostering synergy among different sustainability initiatives

ii) establishing standardised metrics and data sharing mechanisms that allow for improved monitoring and accountability in sustainability efforts

iii) increasing efforts aimed at educating consumers about sustainability and their role in driving market demand for eco-friendly products, encouraging industries to prioritise sustainable practices

iv) facilitating collaborations that connect local communities with global networks, strengthening their capacity to implement sustainability initiatives while integrating traditional knowledge and practices.

v) reviewing and revising existing policies and incentives to ensure they do not obstruct but rather enhance collaborations between local communities and global networks; identifying and deconstructing barriers within these policies that may hinder the implementation of sustainability initiatives or diminish the integration of traditional knowledge and practices, thereby fostering an environment conducive to transformative change

In conclusion, while pathways to transformative change may differ across sectors, the shared commitment to sustainability, robust policies, community engagement, and international collaboration form a robust foundation for transformative change.

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Statement on data availability

The data used to produce this report includes information collected from participatory workshops held for each extensive case study, either in person or online as well as policy mapping exercise conducted by UNEP-WCMC. Findings from the participatory workshop were reported by the case study leaders to the Task 4.2 leader at CzechGlobe. These findings together with the policy mapping output are accessible to all project members through the internal data repository on SharePoint.

Statement on ethics

This report presents data gathered from participatory workshops conducted in the case studies. In accordance with the General Data Protection Regulation (GDPR) of the European Union (EU), informed consent forms were obtained from participants in the case studies (stakeholder boards) who agreed to take part in the participatory workshops of the PLANET4B project.

The authors declare that they have no conflicts of interest.

Annex 1: Workshop protocols for extensive case studies

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Methodology Guide for Task 3.2

(Systems mapping and transformative interventions)

Extensive (sector-based) case studies

CzechGlobe

(Blanka Loučková, Simon Vaňo, Patricia Ofori-Amanfo, Julia Leventon, Elif Tugba Simsek)

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INTRODUCTION

This methodology is based on the Methodology Guide for intensive place-based cases and is specifically adjusted to the extensive sector-based cases.

What is the main difference between intensive and extensive cases?
There are <u>two main differences</u>:

1. Number of the workshops (from here onwards the term **exercises will be used**).
We would like to ask you to provide us with:

1. Exercise on Leverage points (Exercise 1 in this document)
2. Exercise on Indicators (Exercise 2 in this document)
3. Exercise on Broader impact (Exercise 3 in this document)

Important: It is not necessary to provide us with the exercise on Systems mapping (Onion diagram) which is obligatory for intensive cases. However, if you'd like to do the Systems mapping and Onion diagram, as it would make the next exercises easier for you, please feel free to do it (detailed description on how to complete systems mapping + onion diagram can be found here in Methodology Guide for intensive cases)

2. The way to do these exercises: regarding the fact that (according to the project proposal) you and your respective advisory boards will meet at two online or offline workshops, we suggest that **you (= leads of extensive cases) complete the above-mentioned exercises by yourself**. **Once you have completed these exercises by yourself, you will present the outputs (leverage points, indicators, broader impact) to your stakeholders (advisory boards) during the workshops. Workshops will be a place to discuss and review these outputs with your stakeholders**.

EXERCISE 1: LEVERAGE POINTS

WHAT WILL BE DONE
*Using a Leverage Points framework, you will create **a narrative of how change (= better biodiversity outcomes) in the system of your case study happens (the narrative of change).***

NOTE: By the time of completing this exercise, a case study dialogues for Deliverable 1.7 (NINA) will be finished. The leverage points you identified in Case study dialogues for Deliverable 1.7 can be used for this exercise.

Through the exercise, one or few interventions (the levers) will be chosen to explore where in the system (= your case study) they target. You will be then asked to consider how these interventions could lever changes through the materials, processes, design and intent of those systems and in what order.

!! Important note: in case you don't have intervention in your case study: try to brainstorm what things (action, processes) can be done in your case study to produce better biodiversity outcomes

Key questions:
1. What can be done in your cases to produce better biodiversity outcomes?
2. How does the intervention target the leverage points (materials, processes, design, intent)?

GOAL
To create narratives of change as to how specific interventions create change, where in the system, through which leverage points may interventions create desired systems transformation.

OUTPUT
A narrative of change

TOOLS NEEDED:
- ***A4 papers***
- ***Pens and markers***
- ***a short ppt on leverage points***

THEORETICAL BACKGROUND – Leverage points framework

Systems are interconnected networks of actors and organisations, connected via flows of materials, information and power. Within a system thinking perspective, we can understand systems to have properties of *materials, processes, design* and *paradigms.* These properties are leverage points at which we can intervene to change the system towards more sustainable outcomes.

We use the following four categories that characterise leverage points: 1) *materials* 2) *processes* 3) *design* and 4) *intent*. Starting from the deepest, *intent* relates to the worldviews and paradigms that are being embodied and enacted by the system. *Design* refers to the structures, actors and organisations in the system and how they interact with each other. *Processes* refer to the feedbacks or procedures that move materials around the system, and *materials* are the flows of matters within the system, such as money or fabrics and other resources.

The Leverage Points framework says that a change can be created in a system by targeting leverage Points. Shallower leverage points are usually easier to see and

create change, but they do not change the system very far initially. Deeper leverage points are harder to see, but will create more fundamental change. They do so because changing e.g. intent necessarily requires change in all the shallower leverage points.

Further reading:

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Fischer J, Riechers M (2019) A leverage points perspective on sustainability. People Nat 1 (1):115–120. https://doi.org/10.1002/pan3.13

Leventon, J., Buhr, M., Kessler, L. et al. Processes of sustainability transformation across systems scales: leveraging systemic change in the textile sector. Sustain Sci (2023). https://doi.org/10.1007/s11625-023-01436-8 (**examples of interventions targeting specific leverage points)**

Examples of leverage points (from Fischer and Riechers 2019):

Material	**Constants, parameters, numbers**	Average fuel consumption of a car
	Size of buffer stocks, relative to flows	Amount of total standing timber in a production forest
	Structure of material stocks and flows	Run-off dynamics of nutrients from agricultural fields into adjacent water bodies
Processes	**Length of delays, relative to rate of system change**	Time it takes for the ozone hole to close after harmful emissions seize
	Strength of negative feedback loops	The extent to which a lake can absorb nutrients and thus remain clear
	Gain around positive feedback loops	The extent to which poverty leads to population growth, which may further exacerbate poverty
Design	**Structure of information flows**	Consumer knowledge about where certain products come from
	Rules of the system (incentives, constraints)	Policies governing natural resources, including among others taxes and regulations
	Power to change system structure or self-organize	Ability of farmers to organize the sustainable use of a communal pasture

Intent	**Goals of the system**	Organisation of global institutions to support free trade versus global equity
	Paradigm underpinning the system	A 'green revolution' paradigm underpinning agricultural policies
	Power to transcend paradigms	The conscious shift from a growth-based economy growth to a steady-state economy

INSTRUCTIONS

1. Select the intervention(s) you would like to explore in depth as first. These can be interventions they are already trialling, or interventions selected from the PLANET4B directory of methods. Select 1 most important intervention to start with, and maximum 2 other interventions. **In case there is no intervention in your case study, try to brainstorm what things (action, processes) can be done in your case study to produce better biodiversity outcomes**.

2. For the first intervention, discuss and write on an A4 paper (in big letters): i) the brief description of intervention, ii) who instigates the intervention, and iii) who participates in the intervention. Put this on the left-hand side of your table. Write notes in a way that you can easily translate to English – e.g. notes/bullet points not a long text.

3. Use another 4 pieces of A4 paper and label each piece as one of the leverage points (materials, processes, design, intent) – see example below. Complete an A4 sheet for each of the 4 leverage points, exploring **how the intervention selected would target each of the leverage points** (perhaps some leverage points are not included if you feel they aren't targeted by the intervention). **Write the name of the intervention on the bottom** right of each paper so you don't lose track.

4. Put the identified leverage points (= A4 papers) on the table in the order in which the change take place, to describe the narrative of change – e.g. does the intervention target materials first, and then shift processes? Try to narrate the change across LPs.

5. Summarise the change on a final piece of A4 paper and put it at the right end of your leverage points. Try to briefly describe the change in this last A4 paper - to characterise the change that has occurred as a result of the intervention (as described in the LPs). What does the system look like after the intervention has been done?

6. Briefly repeat steps 2-5 for each of selected interventions. Make sure the name of the intervention is always included on the bottom right of each LP so you don't lose track.

7. Once you have completed these exercises by yourself, take the outputs of this exercise and present them to your stakeholders (advisory boards) in your

workshop. Discuss and review these outputs with them. Revise outputs based on discussion with your stakeholders.

REPORTING REQUEST

Once you revise the outputs of this exercise based on the discussion with your stakeholders, please, **translate all A4 papers into English and summarise them in a document, in the order they were written**. Send a picture of them to the CzechGlobe team (louckova.b@czechglobe.cz) altogether with **a brief audio or video description of your narrative of change in English.**

EXERCISE 2: MONITORING AND INDICATORS

WHAT WILL BE DONE

A narrative of change from exercise 1 will be used to create a monitoring strategy and identify indicators of change.

GOAL

To identify a list of indicators of change which will be used to measure success or impacts of interventions (actions, processes) implemented and monitor desired changes in the system after the project has run its course.

OUTPUT

A list of indicators and their characteristics (how they will be measured, their purpose, …)

TOOLS NEEDED

- ***A narrative of change*** created in exercise 1
- ***A4 papers***
- ***Pens***
- ***A short ppt on monitoring and indicators***

INSTRUCTIONS

1. Read the short ppt on monitoring and indicators provided.

2. Look at the **narratives of change** which were created in exercise 1.

3. Write the selected change on the top of an A4 paper and brainstorm **all the indicators of change** (quantitative or qualitative metric) that could be used to measure this change *(example of indicator: percentage increase in ethnic minority communities engaging with nature and the outdoors).*

4. Discuss and write the purpose of the chosen indicators and why they are needed and useful. Write notes in bullet points that you can easily translate to English.

5. Discuss and write how data will be collected to measure the chosen indicators for the change selected (*example: survey, interviews, focus groups*) and how frequently data would be collected *(for example quarterly, annually, bi-annually*).

6. Try to write potential obstacles that may have an impact on the use of the indicator (its accuracy or validity).

7. Return to the narratives of change (Exercise 1) and choose another change. Briefly repeat steps 3-6 for this change.

8. Once you have completed these exercises by yourself, present the indicators you selected to your stakeholders (advisory boards) in your workshop. Discuss and review these outputs with them. Decide together with your stakeholders if each indicator meets the checklist of a good indicator as described in the last ppt slide provided. Allow your stakeholders to make any additional inputs or changes.

REPORTING REQUEST

After the workshop with your stakeholders, please, **translate your A4 papers** into English and send them to the CzechGlobe team (louckova.b@czechlobe.cz). Lastly, please do not forget to take pictures during the workshop!

EXERCISE 3: BARRIERS & OPPORTUNITIES FOR BROADER CHANGE

Topic for discussion:

1. What the advisory board sees as successful and failed efforts to make biodiversity a bigger priority in their sectors? Do they identify any past attempts to scale-up or scale-out biodiversity prioritisation? (*Scaling-up means e.g., to adopt biodiversity in higher policies, scaling-out means e.g., spread practices or management to other sectors/places.)
2. Looking at the proposed interventions from exercise 1, what opportunities and barriers do they identify to make broader impact?

WHAT WILL BE DONE

Identifying broader impact means that we need to look at the potential effects of interventions (see Exercise 1) that go beyond the boundaries of the initial systems where we expect change to take place. Suggest what opportunities and barriers you see in respect to potential broader changes that arise from the interventions in your systems map.

GOAL

To think about ways to increase the impact of proposed interventions that were implemented through specific leverage points (i.e. the system properties, see results of Exercise 1) in the identified systems in your case study.

OUTPUT

Building on exercise 1 Leverage points (the points in the systems where intervention take place), exercise 3 will generate potential broader impact of the intervention(s), barriers to and opportunities for broader impact in your sector. This will be done by writing a narrative of broader impact, opportunities and barriers on A4 papers on a flipchart, or by using large-format paper (flipchart) and post-its. The description will include what the broader impact is, how it manifests, and what the opportunities and barriers are.

TOOLS NEEDED

- ***Pens or pencils***
- ***Optional***
  - ☐ ***Post-it notes*** in multiple colours
  - ☐ ***Markers*** (multiple colours; at least black, blue, red and green)
  - ☐ ***Flipchart***
- ***A set of A4 sheets*** – for a narrative per broader impact, opportunity, and barrier.
- ***A short ppt on barriers and opportunities for broader impact*** (can be downloaded here)

INSTRUCTIONS

1. Revisit **leverage points** including the narratives of change (from exercise 1).

2. See the example in provided ppt slides for a better idea of this exercise.

3. Pick the first intervention and explore potential broader impacts and the related opportunities and barriers. Ask the following questions one by one to execute the exercise:

a. How would you describe potential broader impacts in your case? Identify all relevant impacts that may occur and write them down on e.g. A4. Write down a more detailed description on an A4 paper – a narrative

b. Which other sectors or policies are potentially affected by the intervention? Here you will tap on “neighbouring” or related sectors and policies. Identify and write them down on e.g. A4. Write down a more detailed description on an A4 paper – a narrative

c. Which factors, actors, or processes **enable broader impact**? Here you will identify **opportunities** linked to your interventions and initial sector. Identify all

relevant opportunities and write them down on e.g. green post-its and place them on A4. Write down a more detailed description on an A4 paper – a narrative

d. Which factors, actors, or processes **halt broader change**? Here you will identify **barriers** linked to your interventions and initial sector. Identify all relevant barriers and write them down on e.g. pink post-its and place them on A4. Writes down a more detailed description on an A4 paper – a narrative

4. Pick another intervention (from exercise 1) in your case and continue the exercise in a suit described in the 3rd point. Repeat this with maximum 3 most important interventions

5. Finally, **debrief and discuss results.** Is there anything to add regarding the broader impacts, barriers and opportunities? If several opportunities and barriers per interventions were identified, please highlight the most prominent ones. You can ask any other question that arises from the workshop.

6. Once you have completed these exercises by yourself, present the outputs of this exercises (barriers, opportunities, etc…) to your stakeholders (advisory boards) in your workshop. Discuss and review these outputs with them. Allow your stakeholders to make any additional inputs or changes.

REPORTING REQUEST

After the workshop, **please translate post-it notes and the descriptions (A4 papers) into English and summarise them in a word document**, e.g. in the order they were written or otherwise so we are able to identify their place in the template. **Make a short video, in English, to briefly summarise the information** in the template and on the A4 papers. Send document and video to the CzechGlobe team (louckova.b@czechglobe.cz)

Annex 2: Policy mapping (UNEP-WCMC)

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This section, provided by UNEP-WCMC, summarises the results of a policy mapping exercise that UNEP-WCMC undertook in preparation for WP4 “Synthesizing transformative pathways and ensuring policy relevance”, refer to Section 2 “methodology” for a description of how the policy mapping exercise was conducted. The policy mapping provides a summary of the main biodiversity-related conventions and EU-level policy instruments that are of most relevance to the extensive case studies and their topics and sectors of interest (agriculture, finance, industry, trade, fashion, education). At the global level, our policy mapping includes biodiversity-related conventions and the 2030 Agenda for Sustainable Development, and at the EU level we include biodiversity-related EU legal and policy frameworks covering both EU binding and non-binding normative acts. This policy mapping was used by Czech Globe to inform the development of “transformative pathways for 5 sectors” and was used as the basis for Czech Globe to assess “policy alignment and gaps” between current policy and the interventions identified by the extensive case studies for their respective sectors.

Table 1. List of biodiversity conventions and intergovernmental frameworks identified on account of their relevance to the extensive case studies’ topics of interest.

Multilateral Environmental Agreements, international frameworks and intergovernmental agreements

The Convention on Biological Diversity (CBD), entered into force in 1993, is a legally binding international treaty on biodiversity governance. The CBD has three objectives:

1. The conservation of biological diversity;
2. The sustainable use of the components of biological diversity;
3. The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources, including by appropriate access to genetic resources and by appropriate access transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.

As per Article 6 of the CBD, Parties must develop national plans to implement the Convention.
Article 6: General Measures for Conservation and Sustainable Use
Each Contracting Party shall, in accordance with its particular conditions and capabilities: (a) Develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity or adapt for this purpose existing strategies, plans or programmes which shall reflect, inter alia, the measures set out in this Convention relevant to the Contracting Party concerned; and (b) Integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies.

As per Article 8(j), Parties must ensure the protection of traditional knowledge, innovations and practices and the meaningful contribution of indigenous peoples and local communities towards the three objectives of the Convention.

Implementation of the CBD at the global level is advanced through decisions of its governing body. In 2022, Parties to the CBD adopted **Decision 15/4 on the Kunming-Montreal Global Biodiversity Framework**[1] , which consists of 23 Targets for 2030 and 4 Goals for 2050, to achieve the CBD's Vision of living in harmony with nature by 2050**.** The Framework was adopted as a package of decisions, along with decisions on a monitoring framework for the Kunming-Montreal Global Biodiversity Framework, a mechanism for planning, monitoring, reporting and review, resource mobilisation, capacity-building and development and technical and scientific cooperation, digital sequence information, and a gender plan of action. Decisions of particular relevance to the PLANET4B case studies include **Decision 15/7 Resource mobilisation**[2] to promote the mobilization of adequate financial resource to achieve successful implementation of the Kunming-Montreal Global Biodiversity Framework and **Decision 15/11 Gender Plan of Action**[3] to support and promote the gender responsive implementation of the Kunming-Montreal Global Biodiversity Framework. The CBD has two legally-binding supplementary agreements that outline principles and obligations for their Parties to follow in the implementation of specific aspects of the Convention on Biological Diversity; 1) The **Cartagena Protocol**[4] (2000) entered into force in 2003 and is focused on biosafety and the safe handling, transfer, and use of living modified organisms resulting from biotechnology. The **Nagoya Protocol**[5] (2010) entered into force in 2014 and provides a framework for access to genetic resources and the traditional knowledge associated with genetic resources, and fair and equitable benefit-sharing resulting from their utilization.
The **2030 Agenda for Sustainable Development**[6], adopted by UN Member States in 2015, is a non-legally binding intergovernmental framework which includes 17 Sustainable Development Goals (SDGs) and associated targets that collectively address a range of necessary actions for achieving sustainable development.
International Treaty on Plant Genetic Resources for Food and Agriculture[7], which entered into force in 2004, is a legally binding international agreement that aims to promote the conservation, sustainable use, and fair distribution of benefits derived from plant genetic resources, in harmony with the Convention on Biological Diversity.

Table 2. List of EU binding and non-binding policies and identified on account of their relevance to the extensive case studies' topics of interest.

[1] CBD/COP/DEC/15/4. Available at: https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf
[2] CBD/COP/DEC/15/7. Available at: https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-07-en.pdf
[3] CBD/COP/DEC/15/11. Available at: https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-11-en.pdf
[4] Secretariat of the Convention on Biological Diversity, 2000. Cartagena Protocol on Biosafety to the Convention on Biological Diversity: text and annexes. Available at: https://www.cbd.int/doc/legal/cartagena-protocol-en.pdf
[5] Secretariat of the Convention on Biological Diversity, 2011. Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefi ts Arising from their Utilization to the Convention on Biological Diversity: text and annex. Available at: https://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf
[6] A/RES/70/1. Available at: https://docs.un.org/en/A/RES/70/1
[7] Food and Agriculture Organisation of the United Nations, 2009. International Treaty on Plant Genetic Resources for Food and Agriculture. Available at: https://openknowledge.fao.org/server/api/core/bitstreams/a9d0de2a-8e98-4f75-98a8-673078841030/content

EU Strategies and Action Plans
The **European Green Deal**[8] (2019) consists of a package of policy instruments aiming to support a green transition in the EU, with the ultimate goal of achieving climate neutrality by 2050. Several of the policy instruments below were introduced or revised in order to realise the ambitions of the European Green Deal. The actions and commitments in the European Green Deal reflect the European Union's commitments to intergovernmental agreements and multi-lateral environmental agreements such as the 2030 Agenda for Sustainable Development, the Paris Agreement, and the Convention on Biological Diversity, among others.
The **EU Biodiversity Strategy for 2030**[9] (2020) is the National Biodiversity and Strategy Action Plan (NBSAP) of the European Union, and a key component of the European Green Deal that aligns closely with the Kunming-Montreal Global Biodiversity Framework and the 2030 Sustainable Development Agenda. The goal of the EU Biodiversity Strategy for 2030 is to "Put Europe's biodiversity on a path to recovery by 2030 for the benefit of people, the planet, the climate and our economy", with a longer-term vision that "By 2050, all of the world's ecosystems are restored, resilient, and adequately protected".[10] The EU Biodiversity Strategy for 2030 has four key pillars 1) protect nature, 2) restore nature, 3) enable transformative change, and 4) support biodiversity globally. Under each of the four pillars are a number of actions and commitments to 2030.
The **Farm to Fork Strategy**[11] (2020) is an integral part of the European Green Deal with the primary aim of addressing challenges related to food security, climate change and biodiversity loss by addressing several priority areas including improving the sustainability of food production, processing, distribution and consumption and improving public health and consumer awareness.
The **EU Forest Strategy for 2030**[12] (2021) builds on the Biodiversity Strategy for 2030 and is a key part of the European Green Deal, focused on protecting and restoring European forests and promoting their sustainable management. It emphasises the importance of forests for climate mitigation, biodiversity conservation, rural economies, and ecosystem services. The strategy outlines regulatory, financial, and voluntary measures to **s**upport forest-based industries, enhance sustainability, and improve monitoring and governance and proposes initiatives to prevent deforestation, increase afforestation, and strengthen the sustainable forest bioeconomy.

[8] European Commission, 2019. *Communication from the Commission to the European Parliament, the Council, and European Economic and Social Committee and the Committee of the Regions on the European Green Deal*. COM(2019) 640. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52019DC0640

[9] European Commission, 2020. *Communication from the Commission to the European Parliament, the Council, and European Economic and Social Committee and the Committee of the Regions on the EU Biodiversity Strategy for 2030*. COM(2020) 380. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52020DC0380

[10] European Commission: Directorate-General for Environment, 2021. *EU biodiversity strategy for 2030 – Bringing nature back into our lives*. Publications Office of the European Union. Pp – 8. Available at: https://data.europa.eu/doi/10.2779/677548

[11] European Commission, 2020. *Communication from the Commission to the European Parliament, the Council, and European Economic and Social Committee and the Committee of the Regions on A Farm to Fork Strategy*. COM(2020) 381. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0381

[12] European Commission, 2021. *Communication from the Commission to the European Parliament, the Council, and European Economic and Social Committee and the Committee of the Regions on New EU Forest Strategy for 2030. Available at: https://eur-lex.europa.eu/resource.html?uri=cellar:0d918e07-e610-11eb-a1a5-01aa75ed71a1.0001.02/DOC_1&format=PDF*

The **Circular Economy Action Plan**[13] (2022) is key building block of the European Green Deal that includes legislative and non-legislative measures to reduce pressure on natural resources and transition to a circular economy. It is a prerequisite to achieve the EU's 2050 climate neutrality target and to halt biodiversity loss.
EU Strategy for Sustainable and Circular Textiles[14] (2022) is a strategy to implement the commitments of the EU Green Deal, the Circular Economy Action Plan and the EU Industrial Strategy.
The **EU Renewed Sustainable Finance Strategy**[15] (2021) is a comprehensive plan to align the financial system with the European Green Deal and broader climate and environmental goals. It builds upon the 2018 EU Sustainable Finance Action Plan and introduces new measures to drive investment toward sustainability.
To compliment the European Climate Law, the **EU Adaptation Strategy**[16] (2021) is a non-legally binding policy framework that sets out guidelines on how the EU can adapt to climate change and achieve climate resilience by 2050. Whilst the EU Adaptation Strategy is non-legally binding, Member States must develop National Adaptation Plans under the European Climate Law.
EU laws, regulations and directives
The **Common Agricultural Policy (CAP) 2023 – 2027** is a key policy instrument designed to improve the resilience of agriculture, farming and rural areas in the EU. The latest reform of the Common Agricultural Policy 2023 – 2027 includes specific objectives for improving the environmental sustainability of farming, providing financial support to farmers and rural areas, and ensuring fairness and inclusion in farming and rural communities. These reforms are intended to improve cohesion between the Common Agricultural Policy and other instruments in the European Green Deal, including the Farm to Fork Strategy and the EU Biodiversity Strategy for 2030. The Common Agricultural Policy 2023 – 2027 consists of a set of EU laws:

[13] European Commission, 2020. *Communication from the Commission to the European Parliament, the Council, and European Economic and Social Committee and the Committee of the Regions on A New Circular Economy Action Plan. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1583933814386&uri=COM:2020:98:FIN*

[14] European Commission, 2022. *Communication from the Commission to the European Parliament, the Council, and European Economic and Social Committee and the Committee of the Regions on an EU Strategy for Sustainable and Circular Textiles.* Available at: *https://environment.ec.europa.eu/publications/textiles-strategy_en*

[15] European Commission, 2021. *Communication from the Commission to the European Parliament, the Council, and European Economic and Social Committee and the Committee of the Regions on a Strategy for Financing the Transition to a Sustainable Economy. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021DC0390*

[16] European Commission, 2021. *Communication from the Commission to the European Parliament, the Council, and European Economic and Social Committee and the Committee of the Regions on Forging a climate-resilient Europe - the new EU Strategy on Adaptation to Climate Change.* Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2021:82:FIN

1. CAP Market Organisation Regulation[17] – sets rules on the functioning of EU's agricultural markets with the aim to enhance transparency, market stability, and supportive measures for the agricultural sector.
2. CAP Strategic Plan Regulation[18] – set the rules and procedures for the development and implementation of CAP Strategic Plans by each EU Member State.
3. CAP Horizontal Regulation[19] – sets rules for the monitoring, management and finance of the Common Agricultural Policy 2023 – 2027.

The **Nature Restoration Regulation**[20] (2024) was introduced to support achievement of the EU Biodiversity Strategy for 2030. The regulation requires Member States to restore at least 20% of land areas and 20% of sea areas by 2030, and all ecosystems in need of restoration by 2050. Member States are required to conduct the necessary research and assessments to identify priority areas for restoration and prepare and submit their National Restoration Plans by 2026 to the European Commission for assessment. The National Restoration Plans should outline the planned restoration measures, and corresponding timelines, in order to meet the legally binding restoration targets.

The **Sustainable Use of Pesticides Directive**[21] (2009) is a piece of legislation forming a key part of the EU framework to sustainably manage pesticides. The Directive aims to reduce the risks and impacts of pesticide use on human health and the environment, while promoting integrated pest management (IPM) and alternative approaches to reduce dependency on chemical pesticides. The Directive requires Member States to develop their own National Action Plans to implement the range of actions outlined in the Directive.

The **EU Habitats Directive**[22] (1992) is a cornerstone of EU environmental law aimed at conserving biodiversity, natural habitats, and species across Member States. It establishes the **Natura 2000 network**, the largest coordinated network of protected areas globally. The Directive balances conservation efforts with socio-economic activities, allowing for sustainable land use while legislating strict protection for particular species and habitats. It has undergone several amendments as the composition of the EU has changed, and imposes regular monitoring and reporting responsibilities on Member States.

[17] Regulation (EU) 2021/2117 of the European Parliament and of the Council on Amending Regulations (EU) No 1308/2013 establishing a common organisation of the markets in agricultural products, (EU) No 1151/2012 on quality schemes for agricultural products and foodstuffs, (EU) No 251/2014 on the definition, description, presentation, labelling and the protection of geographical indications of aromatised wine products and (EU) No 228/2013 laying down specific measures for agriculture in the outermost regions of the Union. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2021.435.01.0262.01.ENG

[18] Regulation (EU) 2021/2115 of the European Parliament and of the Council on Establishing rules on Support for Strategic Plans to be drawn up by member States under the Common Agricultural Policy (CAP Strategic Plans) and Financed by the European Agricultural Guarantee Fund (EAGF) and by the European Agricultural Fund for Rural Development (EAFRD) and Repealing Regulations (EU) No 1305/2013 and (EU) No 1307/2013. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2021.435.01.0001.01.ENG

[19] Regulation (EU) 2021/2116 of the European Paliament and of the Council on Financing, Management, Monitoring of the Common Agricultural Policy and Repealing Regulation (EU) no 1306/2013. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2021.435.01.0187.01.ENG

[20] Regulation (EU) 2024/1991 of the European Parliament and of the Council of 24 June 2024 on nature restoration and amending Regulation (EU) no 2022/869. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024R1991&qid=1722240349976

[21] Directive 2009/128/EC of the European Parliament and of the Council on Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides. Available at: https://eur-lex.europa.eu/eli/dir/2009/128/2009-11-25

[22] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. Available at: http://data.europa.eu/eli/dir/1992/43/oj

The **EU Birds Directive**[23] (2009), originally legislated in 1979 and amended in 2009, seeks to conserve wild birds in the EU by setting rules for their protection, management and control. The Birds and Habitats Directives complement one another, with the scope of the Birds Directive including birds, their eggs, nests, and habitats.
The **EU Regulation on Deforestation-free Products**[24] (2023) is a landmark regulation and key tenet of the EU Green Deal, and Biodiversity and Forest Strategies for 2030, focused on reducing the EU's contribution to deforestation and forest degradation worldwide by regulating specific commodities on the EU market and obligating companies to ensure that their supply chains are not linked to deforestation and forest degradation. A one-year delay to its implementation was approved in November 2024, to allow companies and Member States to prepare.
The **Water Framework Directive**[25] (2000) is a comprehensive framework for the protection and management of water in the EU, that applies to groundwater, inland waters, transitional and coastal surface waters. The EU Water Framework Directive links to the EU Circular Economy Action Plan through its emphasis on promoting efficient water management and reuse of water, including in industrial activities.
The **Corporate Sustainability Due Diligence Directive**[26] (2024) outlines legislative ESG responsibilities for large companies. It obligates companies to identify, prevent, and mitigate adverse environmental and human rights impacts in their operations, supply, and value chains. The Directive was watered down before adoption, limiting its scope to large enterprises (>1000 employees with a net worldwide turnover of more than EUR450 million and non-EU companies of any size with a net turnover of EUR450 million within the EU) (see Article 2). As small and medium-sized enterprises comprise the majority of the fashion industry, the impact of the legislation will therefore be dependent on the trickle-down effect from large companies conducting their human and environmental due diligence and expecting their suppliers to do so too.
The **Corporate Sustainability Reporting Directive**[27] (2022) is a piece of legislation strengthening and modernising the Non-Financial Reporting Directive (NFRD), setting new standards for the social and environmental (actual and potential) impacts that large and listed small and medium-sized enterprises are obligated to disclose and periodically report on.

[23] Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds. Available at: http://data.europa.eu/eli/dir/2009/147/oj

[24] Regulation (EU) 2023/1115 of the European Parliament and of the Council of 31 May 2023 on the making available on the Union market and the export from the Union of certain commodities and products associated with deforestation and forest degradation and repealing Regulation (EU) No 995/2010. Available at: http://data.europa.eu/eli/reg/2023/1115/oj

[25] Directive 2000/60/EC of the European Parliament and of the Council on Establishing a Framework for Community Action in the Field of Water Policy. Available at: https://eur-lex.europa.eu/eli/dir/2000/60/oj

[26] Directive 2009/128/EC of the European Parliament and of the Council on Corporate Sustainability Due Diligence and amending Directive (EU) 2019/1937 and Regulation (EU) 2023/2859. Available at: https://eur-lex.europa.eu/eli/dir/2024/1760/oj

[27] Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) Np 537/2014, Directive Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32022L2464

In 2023, the Commission adopted the **European Sustainability Reporting Standards**[28] (2023) to implement the requirements of the Corporate Sustainability Reporting Directive. Standards specific to the financial sector were expected at the end of 2024, however these have been delayed by the European Financial Reporting Advisory Group.

The following tables outline key provisions of selected biodiversity-related conventions and some of their decisions by their governing bodies. It also identifies the most relevant SDGs of the 2030 Agenda for Sustainable Development that are of particular relevance to the extensive case studies' topics of interest.

Table 3. Convention on Biological Diversity and its decisions, the Nagoya Protocol on Access and Benefit Sharing, and the Cartagena Protocol on Biosafety

Convention on Biological Diversity and Kunming-Montreal Global Biodiversity Framework	
Case study	**Relevant text, goals, targets and supporting information**
Agricultural sector (with a focus on enhancing agro-biodiversity through local seed networks)	**Article 8: In-situ conservation** Each Contracting Party shall, as far as possible and as appropriate: (j) "[...] respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge innovations and practices." **Decision 15/4 Kunming Montreal Global Biodiversity Framework** Target 10: Enhance biodiversity and sustainability in agriculture, aquaculture, fisheries and forestry Target 11: restore, maintain and enhance Nature's Contributions to People Target 12: Enhance green spaces and urban planning for human well-being and biodiversity Target 18: Reduce harmful incentives by at least $500 billion per year, and scale up positive incentives for biodiversity Target 23: Ensure gender equality and a gender-responsive approach for biodiversity action

[28] Commission Delegated Regulation (EU) 2023/2772 of 31 July 2023 supplementing Directive 2013/34/EU of the European Parliament and of the Council as regards sustainability reporting standards. Available at: https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:32023R2772

	Section C, "Considerations for the implementation of the Kunming-Montreal Global Biodiversity Framework" provides a series of considerations to inform and guide implementation, monitoring and reporting of the Kunming-Montreal Global Biodiversity Framework. Considerations of particular relevance include: (c) *whole-of-government and whole-of-society approach* *(g) Human rights-based approach* (j) *Consistency with international agreements or instruments* **Decision 15/11 Gender Plan of Action** Objective 1.1: Increase all women and girls' rights to ownership and control over land and access to natural resources and to water, to support the conservation and sustainable use of biodiversity. Indicative action 1.1.2: Take measures to update national legislation so that all women and girls have equitable access to ownership and control over biological resources, as well as land and waters. Objective 1.2: Ensure equal access for all women and girls to resources, services and technologies to support their engagement in the governance, conservation and sustainable use of biodiversity (including financial services, credit, education, training and relevant information among others) Indicative action 1.2.2 Take targeted measures to facilitate equal access of women to financial services and credit, and of all women and girls to education, training, information, among other relevant resources, service and technologies relevant for their engagement in the governance, conservation and sustainable use of biodiversity and the fair and equitable sharing of benefits arising out of the utilization of genetic resources. Objective 1.4: Promote women's empowerment and entrepreneurial opportunities in biodiversity-based supply-chains and sectors, that support sustainable management and production practices Indicative action 1.4.2: Implement supportive interventions to promote women's empowerment and entrepreneurial opportunities in biodiversity-based supply chains and sectors that support sustainable management and production practices Objective 3.5: Ensure that national reports and submissions under the Convention on Biological Diversity provide information on the implementation of the gender plan of action and gender responsive implementation of the post-2020 global biodiversity framework. Indicative actions 3.5.3 Integrate reporting on women's and girl's contributions to the conservation and sustainable use of biodiversity, and on the mainstreaming of gender considerations into NBSAPs, including their implementation, budgeting and reporting, in existing national reporting mechanisms. **The Nagoya Protocol on Access and Benefit Sharing** *Article 5: Fair and Equitable Benefit-sharing*

	2. Each Party shall take legislative, administrative or policy measures, as appropriate, with the aim of ensuring that benefits arising from the utilization of genetic resources that are held by indigenous and local communities, in accordance with domestic legislation regarding the established rights of these indigenous and local communities over these genetic resources, are shared in a fair and equitable way with the communities concerned, based on mutually agreed terms. *Article 6: Access to Genetic Resources* 1. In the exercise of sovereign rights over natural resources, and subject to domestic access and benefit-sharing legislation or regulatory requirements, access to genetic resources for their utilization shall be subject to the prior informed consent of the Party providing such resources that is the country of origin of such resources or a Party that has acquired the genetic resources in accordance with the Convention, unless otherwise determined by that Party. *Article 12: Traditional Knowledge Associated with Genetic Resources* 3. Parties shall endeavour to support, as appropriate, the development by indigenous and local communities, including women within these communities, of: (a) Community protocols in relation to access to traditional knowledge associated with genetic resources and the fair and equitable sharing of benefits arising out of the utilization of such knowledge. 4. Parties, in their implementation of this Protocol, shall, as far as possible, not restrict the customary use and exchange of genetic resources and associated traditional knowledge within and amongst indigenous and local communities in accordance with the objectives of the Convention.
Trade sector (with a focus on safeguarding biodiversity and improving social equity in soy and beef value chains in EU and Brazil)	**Article 8: In-situ conservation** Each Contracting Party shall, as far as possible and as appropriate: (j) "[...] respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge innovations and practices." **Decision 15/4 Kunming Montreal Global Biodiversity Framework** Target 1: Plan and manage all areas to reduce biodiversity loss Target 2: Restore 30% of all degraded ecosystems Target 3: Conserve 30% of land, waters and seas Target 7: Reduce pollution to levels that are not harmful to biodiversity Target 9: Manage wild species sustainably to benefit people Target 10: Enhance biodiversity and sustainability in agriculture, aquaculture, fisheries and forestry Target 13: Increase the sharing of benefits from genetic resources, digital sequence information and traditional knowledge

	Target 15: Businesses assess, disclose and reduce biodiversity-related risks and negative impacts Target 16: Enable sustainable consumption choices to reduce waste and overconsumption Target 22: Ensure participation in decision-making and access to justice and information related to biodiversity for all Target 23: Ensure gender equality and a gender-responsive approach for biodiversity action Section C, "Considerations for the implementation of the Kunming-Montreal Global Biodiversity Framework" provides a series of considerations to inform and guide implementation, monitoring and reporting of the Kunming-Montreal Global Biodiversity Framework. Considerations of particular relevance include: (c) *whole-of-government and whole-of-society approach* (e) *Collective effort towards the targets* *(g) Human rights-based approach* (j) *Consistency with international agreements or instruments* **Decisions 15/7 Resource mobilisation** C. Objectives 2. Identify and eliminate, phase out, or reform financial resource flows causing harm (b) Strengthen risk assessment and transparent reporting requirement of international private finance and business actors. **The Nagoya Protocol on Access and Benefit Sharing** *Article 5: Fair and Equitable Benefit-sharing* 1. Each Party shall take legislative, administrative or policy measures, as appropriate, with the aim of ensuring that benefits arising from the utilization of genetic resources that are held by indigenous and local communities, in accordance with domestic legislation regarding the established rights of these indigenous and local communities over these genetic resources, are shared in a fair and equitable way with the communities concerned, based on mutually agreed terms. *Article 6: Access to Genetic Resources* *1.* In accordance with domestic law, each Party shall take measures, as appropriate, with the aim of ensuring that the prior informed consent or approval and involvement of indigenous and local communities is obtained for access to genetic resources where they have the established right to grant access to such resources. **The Cartagena Protocol on Biosafety** *Article 25: Socio-economic considerations* 1. The Parties, in reaching a decision on import under this Protocol or under its domestic measures implementing the Protocol, may take into account, consistent with their international obligations, socio-economic considerations arising from the impact of living modified organisms on the conservation and

	sustainable use of biological diversity, especially with regard to the value of biological diversity to indigenous and local communities. 2. The Parties are encouraged to cooperate on research and information exchange on any socio-economic impacts of living modified organisms, especially on indigenous and local communities.
Textile sector (with a focus on reducing the impact of the textile industry on biodiversity)	**Decision 15/4 Kunming Montreal Global Biodiversity Framework** Target 7: Reduce pollution to levels that are not harmful to biodiversity Target 14: Integrate biodiversity in decision-making at every level Target 15: Businesses assess, disclose, and reduce biodiversity-related risks and negative impacts Target 16: Enable sustainable consumption choices to reduce waste and overconsumption Target 18: Reduce harmful incentives by at least $500 billion per year, and scale up positive incentives for biodiversity Section C, "Considerations for the implementation of the Kunming-Montreal Global Biodiversity Framework" provides a series of considerations to inform and guide implementation, monitoring and reporting of the Kunming-Montreal Global Biodiversity Framework. Considerations of particular relevance include: (c) *whole-of-government and whole-of-society approach* **Decisions 15/7 Resource mobilisation** C. Objectives 2. Identify and eliminate, phase out, or reform financial resource flows causing harm (b) Strengthen risk assessment and transparent reporting requirement of international private finance and business actors.
Education sector (with a focus on fostering "nature-relatedness" in Hungarian schools)	**Decision 15/4 Kunming Montreal Global Biodiversity Framework** Target 21: Ensure that knowledge is available and accessible to guide biodiversity action Section C, "Considerations for the implementation of the Kunming-Montreal Global Biodiversity Framework" provides a series of considerations to inform and guide implementation, monitoring and reporting of the Kunming-Montreal Global Biodiversity Framework. Considerations of particular relevance include: (o) *Formal and informal education* **Decision 16/10 Communication, education and public awareness** Annex II. 1. (c) Actions by Parties 26. Parties are encouraged to develop national communications plans for raising awareness of the need to implement and monitor the Framework with the inclusion of indigenous peoples and local communities, women and youth. Parties should disseminate the plans to relevant stakeholders.

Agricultural sector (with a focus on the biodiversity-agriculture-labour migration nexus)	**Decision 15/4 Kunming Montreal Global Biodiversity Framework** Target 10: Enhance biodiversity and sustainability in agriculture, aquaculture, fisheries and forestry Target 18: Reduce harmful incentives by at least $500 billion per year, and scale up positive incentives for biodiversity Target 21: Ensure that knowledge is available and accessible to guide biodiversity action Section C, "Considerations for the implementation of the Kunming-Montreal Global Biodiversity Framework" provides a series of considerations to inform and guide implementation, monitoring and reporting of the Kunming-Montreal Global Biodiversity Framework. Considerations of particular relevance include: (c) *whole-of-government and whole-of-society approach* (g) *Human rights-based approach* (j) *Consistency with international agreements or instruments* (o) *Formal and informal education*
Finance sector (with a focus on encouraging sustainable investment behaviour in the EU)	**Decision 15/4 Kunming Montreal Global Biodiversity Framework** Target 19: Mobilize $200 billion per year for biodiversity from all sources, including $30 billion through international finance Section C, "Considerations for the implementation of the Kunming-Montreal Global Biodiversity Framework" provides a series of considerations to inform and guide implementation, monitoring and reporting of the Kunming-Montreal Global Biodiversity Framework. Considerations of particular relevance include: (p) *The full implementation of the Framework requires adequate, predictable and easily accessible financial resources;* (q) *Enhanced collaboration, cooperation and synergies between the Convention on Biological Diversity and its Protocols, other biodiversity-related conventions, other relevant multilateral agreements and international organizations and processes, in line with their respective mandates, including at the global, regional, subregional and national levels, would contribute to and promote the implementation of the Framework in a more efficient and effective manner.* **Decision 15/7 Resource mobilisation** C. Objectives 2. Identify and eliminate, phase out, or reform financial resource flows causing harm (b) Strengthen risk assessment and transparent reporting requirement of international private finance and business actors. 3. Enhance the effectiveness of resource use

	(c) Increase transparency and accountability, monitoring and reporting, of biodiversity-related public and private financing at all levels; 5. Identify and eliminate, phase out, or reform financial resource flows causing harm (b) Private sector mainstreaming: ensure or encourage, as appropriate, alignment of relevant fiscal, private and financial flows with the objectives of the Convention; (c) Mainstreaming biodiversity in the financial sector; (d) Identify and eliminate, phase out or reform incentives, including subsidies, that are harmful for biodiversity, in line with other relevant international obligations; (e) Encourage the monitoring, assessment and transparent disclosure by financial institutions of biodiversity risks, dependencies and impacts of financial portfolios and operations; decrease or eliminate negative impacts on ecosystems and biodiversity of investments.

Table 4. 2030 Agenda on Sustainable Development

2030 Agenda on Sustainable Development	
Case study	**Relevant text, goals and targets**
Agricultural sector (with a focus on enhancing agro-biodiversity through local seed networks)	**Sustainable Development Goals (SDG)** **SDG 2:** End hunger, achieve food security and improved nutrition and promote sustainable agriculture. **Target 2.3:** By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment. **Target 2.4:** By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality. **Target 2.5:** By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed. **SDG 5:** Achieve gender equality and empower all women and girls. **Target 5.4:** Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibili8ty within the household and the family as nationally appropriate.

	Target 5.5: Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life. **SDG 12:** Ensure sustainable consumption and production patterns. **Target 12.3:** By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses. **Target 12.7:** Promote public procurement practices that are sustainable, in accordance with national policies and priorities. **Target 12.8:** By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.
Trade sector (with a focus on safeguarding biodiversity and improving social equity in soy and beef value chains in EU and Brazil)	**Sustainable Development Goals (SDG)** **SDG 1:** End poverty in all its forms everywhere. **Target 1.4:** By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance. **SDG 2:** End hunger, achieve food security and improved nutrition and promote sustainable agriculture. **Target 2.3:** By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment. **Target 2.4:** By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality. **Target 2.5:** By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed. **Target 2a:** Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries. **Target 2b:** Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round. **SDG 8:** Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. **Target 8.3:** Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services.

	SDG 10: Reduce inequality within and among countries. **Target 10.2:** By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status. **Target 10.4:** Adopt policies, especially fiscal, wage and social protection policies, and progressively achieve greater equality. **Target 10.5:** Improve the regulation and monitoring of global financial markets and institutions and strengthen the implementation of such regulations. **Target 10.6:** Ensure enhanced representation and voice for developing countries in decision-making in global international economic and financial institutions in order to deliver more effective, credible, accountable and legitimate institutions. **Target 10a:** Implement the principle of special and differential treatment for developing countries, in particular least developed countries, in accordance with World Trade Organization agreements. **SDG 12:** Ensure sustainable consumption and production patterns. **Target 12.1:** Implement the 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries. **Target 12.2:** By 2030, achieve the sustainable management and efficient use of natural resources. **Target 12.6:** Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle. **Target 12.8:** By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature. **Target 12a:** Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production. **SDG 15:** Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. **Target 15.1:** By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements. **Target 15.2:** By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally. **Target 15.b:** Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation. **SDG 16:** Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels. **Target 16b:** Promote and enforce non-discriminatory laws and policies for sustainable development. **SDG 17:** Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development. **Target 17.10:** Promote a universal, rules-based, open, non-discriminatory and equitable multilateral trading system under the World Trade Organization, including through the conclusion of negotiations under its Doha Development Agenda. **Target 17.11:** Significantly increase the exports of developing countries, in particular with a view to doubling the least developed countries' share of global

	exports by 2020. **Target 17.13:** Enhance global macroeconomic stability, including through policy coordination and policy coherence.
Textile sector (with a focus on reducing the impact of the textile industry on biodiversity)	**Sustainable Development Goals (SDG)** **SDG 6:** Ensure availability and sustainable management of water and sanitation for all. **Target 6.3:** By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally. **Target 6.4:** By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity. **SDG 12:** Ensure sustainable consumption and production patterns. **Target 12.1:** Implement the 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries. **Target 12.2:** By 2030, achieve the sustainable management and efficient use of natural resources. **Target 12.4:** By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment. **Target 12.5:** By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse. **Target 12.6:** Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle. **Target 12.7:** Promote public procurement practices that are sustainable, in accordance with national policies and priorities. **Target 12.8:** By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.
Education sector (with a focus on fostering “nature-relatedness” in Hungarian schools)	**Sustainable Development Goals (SDG)** **SDG 4:** Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. **Target 4.7:** By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture’s contribution to sustainable development.
Agricultural sector (with a focus on the biodiversity-agriculture-labour migration nexus)	**Sustainable Development Goals (SDG)** **SDG 8:** Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. **Target 8.8:** Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment.

	SDG 10: Reduce inequality within and among countries. **Target 10.7:** Facilitate orderly, safe, regular and responsible migration and mobility of people, including through the implementation of planned and well-managed migration policies. **SDG 15:** Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. **SDG 16:** Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels. **Target 16.b:** Promote and enforce non-discriminatory laws and policies for sustainable development.
Finance sector (with a focus on encouraging sustainable investment behvaiour in the EU)	**Sustainable Development Goals (SDG)** **SDG 17:** Strengthen the means of implementation and revitalize the Global Partnerships for Sustainable Development. **Target 17.5**: Adopt and implement investment promotion regimes for least developed countries.

Table 5. International Treaty on Plant Genetic Resources for Food and Agriculture

International Treaty on Plant Genetic Resources for Food and Agriculture	
Case study	**Relevant text, goals and targets**
Agricultural sector (with a focus on enhancing agro-biodiversity through local seed networks)	*Article 5: Conservation, Exploration, Collection, Characterization, Evaluation and Documentation of Plant Genetic Resources for Food and Agriculture* 5.1 Each Contracting Party shall [...] c) Promote or support, as appropriate, farmers and local communities' efforts to manage and conserve on-farm their plant genetic resources for food and agriculture; d) Promote in situ conservation of wild crop relatives and wild plants for food production, including in protected areas, by supporting, inter alia, the efforts of indigenous and local communities *Article 6: Sustainable Use of Plant Genetic Resources* 6.2 The sustainable use of plant genetic resources for food and agriculture may include such measures as: c) promoting, as appropriate, plant breeding efforts which, with the participation of farmers, particularly in developing countries, strengthen the capacity to develop varieties particularly adapted to social, economic and ecological conditions, including in marginal areas; e) promoting, as appropriate, the expanded use of local and locally adapted crops, varieties and underutilized species; f) supporting, as appropriate, the wider use of diversity of varieties and species in on farm management, conservation and sustainable use of crops and creating strong links to plant breeding and agricultural development in order to reduce crop vulnerability and genetic erosion, and promote increased world food production compatible with sustainable development.

	Article 9: Farmers' Rights 9.1 The Contracting Parties recognize the enormous contribution that the local and indigenous communities and farmers of all regions of the world, particularly those in the centres of origin and crop diversity, have made and will continue to make for the conservation and development of plant genetic resources which constitute the basis of food and agriculture production throughout the world. 9.2 [...] each Contracting Party should, as appropriate, and subject to its national legislation, take measures to protect and promote Farmers' Rights, including: a) protection of traditional knowledge relevant to plant genetic resources for food and agriculture; b) the right to equitably participate in sharing benefits arising from the utilization of plant genetic resources for food and agriculture; and c) the right to participate in making decisions, at the national level, on matters related to the conservation and sustainable use of plant genetic resources for food and agriculture.
Trade sector (with a focus on safeguarding biodiversity and improving social equity in soy and beef value chains in EU and Brazil)	*Article 5: Conservation, Exploration, Collection, Characterization, Evaluation and Documentation of Plant Genetic Resources for Food and Agriculture* 5.1 Each Contracting Party shall [...] e) Cooperate to promote the development of an efficient and sustainable system of ex situ conservation, giving due attention to the need for adequate documentation, characterization, regeneration and evaluation, and promote the development and transfer of appropriate technologies for this purpose with a view to improving the sustainable use of plant genetic resources for food and agriculture.
Agricultural sector (with a focus on the biodiversity-agriculture-labour migration nexus)	*Article 9: Farmers' Rights* 9.2 [...] each Contracting Party should, as appropriate, and subject to its national legislation, take measures to protect and promote Farmers' Rights, including: b) the right to equitably participate in sharing benefits arising from the utilization of plant genetic resources for food and agriculture.

The following tables outline the specific text, goals and targets of the **EU policy instruments** that are of particular relevance to the extensive case studies' topics of interest.

Table 6. EU Biodiversity Strategy for 2030

EU Biodiversity Strategy for 2030	
Case study	**Relevant text, goals, targets and supporting information**
Agricultural sector (with a focus on enhancing agro-biodiversity through local seed networks)	Pillar 2: Restoring Nature. Key commitments: ○ Reverse the decline of pollinators; ○ Ensure that at least 10% of agricultural area is under high-biodiversity landscape features; ○ Reduce the use of chemical pesticides by 50% and reduce the use of more hazardous pesticides by 50%; ○ Ensure that at least 10% of agricultural area is under high-biodiversity landscape features. ○ Place at least 25% of agricultural land under organic farming management, and significantly increase the uptake of agro-ecological practices. ○ Minimise or eliminate the use of pesticides in sensitive areas such as urban green gardens. Pillar 3: Enabling transformative change. Key commitment: ○ Use the new Skills Agenda to help biodiversity restoration and sustainable management, as well as fair and inclusive transition to a green economy.
Trade sector (with a focus on safeguarding biodiversity and improving social equity in soy and beef value chains in EU and Brazil)	Pillar 3: Enabling transformative change. Key commitment: ○ Build on a whole of society approach. The Commission will support the development of a Business for Biodiversity movement and will work with business and create incentives and eliminate barriers for the take-up of nature-based solutions that can lead to significant business and employment opportunities in various sectors. Pillar 4: A global biodiversity agenda. Key commitment: ○ Ensure full implementation and enforcement of the biodiversity provisions in all trade agreements, and better assess the impact of trade agreements on biodiversity. ○ Introduce measures to avoid placing products associated with deforestation on the EU market and promote forest friendly imports and value chains. ○ Cooperate with partners to mainstream biodiversity into all development and partnership policies, increase financial support and phase out subsidies harmful to biodiversity.
Textile sector (with a focus on reducing the impact of the textile industry on biodiversity)	Pillar 2: Restoring nature in the EU. Key commitments: ○ Restore nature and ensure its sustainable management across all sectors and ecosystems. ○ Reduce the use of chemical pesticides by 50% and reduce the use of more hazardous pesticides by 50%. ○ Place at least 25% of agricultural land under organic farming management, and significantly increase the uptake of agro-ecological practices. Pillar 3: Enabling transformative change. Key commitment:

	○ Launch a new initiative for sustainable corporate governance and support a European Business for Biodiversity movement. Pillar 4: A global biodiversity agenda. Key commitment: ○ Ensure full implementation and enforcement of the biodiversity provisions in all trade agreements, and better assess the impact of trade agreements on biodiversity.
Education sector (with a focus on fostering “nature-relatedness” in Hungarian schools)	Pillar 3: Enabling transformative change. Key commitment: ○ Propose a Council Recommendation on education and environmental sustainability. In 2022, a **Council recommendation on learning for the green transition and sustainable development** was published, providing guidance on the integration of biodiversity and ecosystems into schools, higher education and professional training, advocating diverse, interdisciplinary methods of learning.
Agricultural sector (with a focus on the biodiversity-agriculture-labour migration nexus)	Pillar 2: Restoring nature in the EU ○ Reverse the decline of pollinators; ○ Ensure that at least 10% of agricultural area is under high-biodiversity landscape features; ○ Reduce the use of chemical pesticides by 50% and reduce the use of more hazardous pesticides by 50%; ○ Ensure that at least 10% of agricultural area is under high-biodiversity landscape features. Pillar 3: Enabling transformative change ○ Propose a Council Recommendation on education and environmental sustainability.

Table 7: Farm to Fork Strategy

Farm to Fork Strategy	
Case study	**Relevant text, goals, targets and supporting information**

Agricultural sector (with a focus on enhancing agro-biodiversity through local seed networks)	As part of the **Farm to Fork Strategy**, in 2020 the European Commission announced two non-legally binding targets relating to the use of pesticides: Target 1: reduce by 50% the use and risk of chemical pesticides by 2030 Target 2: reduce by 50% the use of more hazardous pesticides by 2030 Revisions to the **Regulation on Sustainable Use of Pesticides** (Directive 2009/128/EC) were proposed in 2022, requiring Member States to draw up National Action Plans to implement the actions set out in the Directive. However, the proposal has since been withdrawn by the Commission following rejection by the European Parliament. The Farm to Fork Strategy aims to introduce several new pieces of legislation, including: **legislation to enhance cooperation** of primary producers to support their position in the food chain and non-legislative initiatives to improve transparency, and a proposal for a **legislative framework for sustainable food systems** will be made (expected 2025). There will also be a revision of EU marketing standards for agricultural, fishery and aquaculture products to ensure the uptake and supply of sustainable products
Agricultural sector (with a focus on the biodiversity-agriculture-labour migration nexus)	

Table 8: Forest Strategy for 2030

EU Forest Strategy for 2030	
Case study	**Relevant text, goals and targets**
Agricultural sector (with a focus on enhancing agro-biodiversity through local seed networks)	*Section 3.3. Re- and afforestation of biodiverse forests* "This concerns [...] agricultural area (including e.g. in abandoned areas as well as through agroforestry and silvopastures, landscape features and the establishment of ecological corridors). [...] enhanced afforestation is also among the most effective climate change and disaster risk mitigation strategies in the forest sector, and can create substantial job opportunities, e.g. in relation to collecting and cultivating of seeds, planting seedlings, and ensuring their development, as well as providing socio-economic benefits to local communities." *Section 3.4. Financial incentives for forest owners and managers for improving the quantity and quality of EU forests* The text references the Common Agricultural Policy (CAP), noting that the recommendations to Member States on CAP Strategic Plans (for 2023-2027) have encouraged due consideration of forests. [...] The Commission will strive to increase the uptake of rural development funds available for the purposes of this strategy.

	Further action needs to be undertaken by Member States for better involving forest stakeholders in the development of the CAP Strategic Plans. [...] The Commission will provide new means to share information on good practices to better design and implement forest relevant interventions, fostering the exchange between experts in Member States, providing demonstration tools for consistent use of funding, and supporting local and regional networking, including in situ demonstration initiatives. In the assessment of CAP Strategic Plans the Commission will notably pay attention to forest related measures, which have strong synergies with the EU's climate and biodiversity objectives. Member States are also encouraged to accelerate the roll out of carbon farming practices, for instance via eco-schemes on agroforestry or rural development interventions to cover biodiversity-friendly re- and afforestation investments, agroforestry and other non-productive investments for environment- and climate-related objectives.
Education sector (with a focus on fostering "nature-relatedness" in Hungarian schools)	*Section 2.4. Developing skills and empowering people for sustainable forest-based bioeconomy* recommends harnessing the European Social Fund Plus (ESF+) to enhance employment and entrepreneurship through new enterprises valorising the sustainable use of forestry products and services such as ecotourism or educational programmes about forest biodiversity.

Table 9: Common Agricultural Policy 2023 – 2027

Common Agricultural Policy 2023 - 2027

Case study	Relevant text, goals, targets and supporting regulations
Agricultural sector (with a focus on enhancing agro-biodiversity through local seed networks) Agricultural sector (with a focus on the biodiversity-agriculture-labour migration nexus)	**CAP Strategic Plan Regulation** *Title II: Objectives and indicators* Article 6: Specific objectives (c) to improve the farmers' position in the value chain; (e) to foster sustainable development and efficient management of natural resources such as water, soil and air, including by reducing chemical dependency; (f) to contribute to halting and reversing biodiversity loss, enhance ecosystem services and preserve habitats and landscapes; (h) to promote employment, growth, gender equality, including the participation of women in farming, social inclusion and local development in rural areas, including the circular bio-economy and sustainable forestry; *Chapter II: Types of intervention in the form of direct payments* Article 31: Schemes for the climate, the environment and animal welfare 1. Member States shall establish, and provide support for, voluntary schemes for the climate, the environment and animal welfare ('eco-schemes') under the conditions set out in this Article and as further specified in their CAP Strategic Plans. 2. Member States shall support under this Article active farmers or groups of active farmers who make commitments to observe agricultural practices beneficial for the climate, the environment and animal welfare and combatting antimicrobial resistance. *Chapter IV: Types of intervention for rural development* Article 70: Environmental, climate-related and other management commitments 1. Member States shall include agri-environment-climate commitments among the interventions in their CAP Strategic Plans and may include other management commitments therein. The payments for those commitments shall be granted under the conditions set out in this Article and as further specified in the CAP Strategic Plans. 2. Member States shall grant payments only to farmers or other beneficiaries who undertake, on a voluntary basis, management commitments which are considered to be beneficial to achieving one or more of the specific objectives set out in Article 6(1) and (2). Article 75: Setting-up of young farmers and new farmers and rural business start-up 1. Member States may grant support for the setting-up of young farmers and the start-up of rural businesses, including the setting-up of new farmers, under the conditions set out in this Article and as further specified in their CAP Strategic Plans with the view of contributing to the achievement of one or more of the specific objectives set out in Article 6(1) and (2). *Title IV: Financial Provisions* Article 97: Minimum financial allocation for eco-schemes 1. At least 25 % of the allocations set out in Annex IX shall be reserved for every calendar year from 2023 to 2027 for eco-schemes […] *Title VI: Coordination and governance*

	Article 126: National and European CAP networks 1. Each Member State shall establish a national network for the common agricultural policy ('national CAP network') for the networking of organisations and administrations, advisors, researchers and other innovation actors, and other actors in the field of agriculture and rural development at national level […]

Table 10: Nature Restoration Regulation

Nature Restoration Regulation	
Case study	**Relevant text, goals, targets and supporting information**
Agricultural sector (with a focus on enhancing agro-biodiversity through local seed networks)	Chapter 1: General Provisions *Article 1: Subject matter* *2.* This Regulation establishes a framework within which Member States shall put in place effective and area-based restoration measures with the aim to jointly cover, as a Union target, throughout the areas and ecosystems within the scope of this Regulation, at least 20 % of land areas and at least 20 % of sea areas by 2030, and all ecosystems in need of restoration by 2050. Chapter 11: Restoration Targets and Obligations *Article 11: Restoration of Agricultural Ecosystems* 2. Member states shall put in place the restoration measures necessary to enhance biodiversity in agricultural ecosystems, in addition to the areas that are subject to restoration measures under Article 4(1), (4) and (7), taking into account climate change, the social and economic needs of rural areas and the need to ensure sustainable agricultural production in the Union. Among the "list of examples of restoration measures referred to in Article 14(16)" includes: (17) "Increase the agricultural area subject to agro-ecological management approaches such as organic agriculture or agro-forestry, multicropping and crop rotation, integrated pest and nutrient management."[29]
Agricultural sector (with a focus on the biodiversity-agriculture-labour migration nexus)	

Table 11: EU Regulation on Deforestation-free Products

[29] Annex VII

Regulation on Deforestation-free Products	
Case study	**Relevant text and supporting information**
Agricultural sector (with a focus on enhancing agro-biodiversity through local seed networks)	*Recital 29* states that Member States should enhance support for forest protection and deforestation-free production while acknowledging and strengthening the rights of indigenous peoples and local communities. This includes improving land tenure, promoting sustainable forest management with a focus on closer-to-nature forestry practices, agro-ecology and agroforestry. *Recital 57* notes that respecting indigenous and local peoples' rights helps protect biodiversity, mitigate climate change, and address public interest concerns. It states that indigenous communities possess valuable traditional ecological and medicinal knowledge and often model sustainable forest resource use; they support in-situ conservation under the CBD.
Textile sector (with a focus on reducing the impact of the textile industry on biodiversity)	While the EUDR does not extend to materials ubiquitous in the textile industry such as cotton and Man-Made Cellulosic Fibers (MMCF), it does cover materials key to the industry, including leather (cattle) and rubber. Annex I specifies commodities covered, including rubber and leather. A commodity scope of the regulation will take place within two years of it coming into force.
Trade sector (with a focus on safeguarding biodiversity and improving social equity in soy and beef value chains in EU and Brazil)	The EUDR requires companies trading in agricultural commodities, including cattle-derived products from Brazil, demonstrate that they were not produced on recently deforested land. *Recitals 12-18* detail the severe impact of agriculture on deforestation, specifically livestock grazing, crop expansion, and feed for livestock, and notes the consumption of the European Union as a key driver. *Recital 21* notes the importance of the private sector in addressing deforestation, and states that companies trading in agricultural commodities (including soy and cattle-derived products from Brazil) must demonstrate that they were not produced on recently deforested land. *Recital 22* specifies the EUDR's goal to "support smallholders, indigenous peoples, and local communities". *Recital 39* states that operators must conduct geolocation tracking of supply sources to ensure that products do not contribute to deforestation, with specific reference to cattle-derived products and animal feed. *Recital 49* notes that operators must establish due diligence systems that comprise information requirements, risk assessment and risk mitigation measures, and are complemented by reporting obligations. *Article 3: Prohibitions* Relevant commodities and relevant products shall not be placed or made available on the market or exported, unless all the following conditions are fulfilled: (a) they are deforestation-free; (b) they have been produced in accordance with the relevant legislation of the country of production; and (c) they are covered by a due diligence statement.

	Article 4: Obligations of Operators 7. Operators shall communicate to operators and to traders further down the supply chain of the relevant products they placed on the market or exported all information necessary to demonstrate that due diligence was exercised and that no or only a negligible risk was found, including the reference numbers of the due diligence statements associated to those products.

Table 12: Sustainable use of Pesticides Directive

Sustainable use of Pesticides Directive	
Case study	**Relevant text, goals and targets**
Agricultural sector (with a focus on enhancing agro-biodiversity through local seed networks)	*Article 14: Integrated Pest Management (IPM)* Promotes the use of IPM, which is a key agricultural practice aimed at reducing pesticide use and promoting sustainable farming. Member States must promote low pesticide-input pest management, giving wherever possible priority to non-chemical methods, so that professional users of pesticides switch to practices and products with the lowest risk to human health and the environment among those available for the same pest problem. Annex III outlines the principles of IPM and its implementation in agriculture.
Textile sector (with a focus on reducing the impact of the textile industry on biodiversity)	*Article 11: Specific measures to protect the aquatic environment and drinking water* Requires Member States to implement measures to protect water bodies from pesticide contamination.
Education sector (with a focus on fostering “nature-relatedness” in Hungarian schools)	*Chapter II Training, sales of pesticides, information and awareness raising* *Article 7: Information and awareness-raising* Member States must inform the public about the risks of pesticide use and promote awareness of non-chemical alternatives. This involves educational awareness-raising campaigns and public outreach.

Table 13: EU Habitats Directive

EU Habitats Directive	
Case study	**Relevant text, goals and targets**

Agricultural sector (with a focus on enhancing agro-biodiversity through local seed networks)	Article 22: [...] Member States shall: (a) study the desirability of re-introducing species in Annex IV that are native to their territory where this might contribute to their conservation, provided that an investigation, also taking into account experience in other Member States or elsewhere, has established that such re-introduction contributes effectively to re-establishing these species at a favourable conservation status and that it takes place only after proper consultation of the public concerned; (b) ensure that the deliberate introduction into the wild of any species which is not native to their territory is regulated so as not to prejudice natural habitats within their natural range or the wild native fauna and flora and, if they consider it necessary, prohibit such introduction.
Education sector (with a focus on fostering “nature-relatedness” in Hungarian schools)	Article 22: [...] Member States shall: (a) promote education and general information on the need to protect species of wild fauna and flora and to conserve their habitats and natural habitats.

Table 14: EU Birds Directive

EU Birds Directive	
Case study	**Relevant text, goals and targets**
Agricultural sector (with a focus on enhancing agro-biodiversity through local seed networks)	*Recital 6*: [...] measures to be taken must apply to the various factors which may affect the numbers of birds, namely the repercussions of man’s activities and in particular the destruction and pollution of their habitats, capture and killing by man and the trade resulting from such practices; the stringency of such measures should be adapted to the particular situation of the various species within the framework of a conservation policy.

Table 15: EU Strategy for Sustainable and Circular Textiles

EU Strategy for Sustainable and Circular Textiles	
Case study	**Relevant text, goals, targets and supporting regulations**

Textile sector (with a focus on reducing the impact of the textile industry on biodiversity)	As part of the **EU Strategy for Sustainable Circular Textiles**, brands will need to disclose the life cycles of their products and educate consumers about product durability and disposal. Companies and consumers will be encouraged to repair, recycle and reuse clothing and footwear. Brands are being called on to reduce the frequency of product releases (the 'fast fashion' cycle), with the aim of reducing overproduction and overconsumption. In 2023, a Transition Pathway for the Textiles Ecosystem was published, and the Commission proposed a revision to the Waste Framework Directive to introduce mandatory and harmonised Extended Producer Responsibility schemes for textiles in all EU Member States.

Table 16: EU Circular Economy Action Plan

EU Circular Economy Action Plan	
Case study	**Relevant text, goals, targets and supporting information**
Textile sector (with a focus on reducing the impact of the textile industry on biodiversity)	The **EU Circular Economy Action Plan** includes initiatives along the entire life cycle of products. It targets how products are designed, promotes circular processes, encourages sustainable consumption, and aims to ensure that waste is prevented and the resources used are kept in the EU economy for as long as possible. The Action Plan is focused on sectors that use the most resources and where the potential for circularity is high, including textiles. **Section 3.5. focuses on textiles.** Key aims include addressing fast fashion, driving new business models and boosting the EU market for sustainable and circular textiles and the market for textile reuse.

Table 17: Corporate Sustainability Due Diligence Directive

Corporate Sustainability Due Diligence Directive	
Case study	**Relevant text, goals and targets**

Textile sector (with a focus on reducing the impact of the textile industry on biodiversity) Trade sector (with a focus on safeguarding biodiversity and improving social equity in soy and beef value chains in EU and Brazil)	**Recital 11** notes that the Directive tackles production and procurement to fulfil the Union's "aims to accelerate the green transition to a climate-neutral, sustainable, non-toxic, resource-efficient, renewable energy-based, resilient and competitive circular economy in a just, equitable and inclusive way, and to protect, restore and improve the state of the environment by, inter alia, halting and reversing biodiversity loss." **Recital 25 "**The chain of activities should cover activities of a company's upstream business partners related to the production of goods or the provision of services by the company, including the design, extraction, sourcing, manufacture, transport, storage and supply of raw materials, products or parts of the products and development of the product or the service, and activities of a company's downstream business partners related to the distribution, transport and storage of the product, where the business partners carry out those activities for the company or on behalf of the company." **Recital 32** "[...] Due diligence requirements under this Directive should therefore contribute to preserving and restoring biodiversity and improving the state of the environment, in particular the air, water and soil, including to better protect human rights. [...]" **Article 5** 1. Member States shall ensure that companies conduct risk-based human rights and environmental due diligence [...] by carrying out the following actions: (a) integrating due diligence into their policies and risk management systems (e) carrying out meaningful engagement with stakeholders [...] (g) monitoring the effectiveness of their due diligence policy and measures [...]
Finance sector (with a focus on encouraging sustainable investment behaviour in the EU)	**Recital 51:** Although regulated financial undertakings are only subject to due diligence obligations for the upstream part of their chains of activities, the specificities of financial services as well as the MNE (Multinational Enterprises) Guidelines provide indications of the types of measures that are appropriate and effective for financial undertakings to take in due diligence processes. As it is highlighted also in the MNE Guidelines, the specificities of financial services need to be acknowledged. Regulated financial undertakings are expected to consider adverse impacts and to use their so-called 'leverage' to influence companies. The exercise of shareholders' rights can be a way to exercise leverage. *Article 3: Definitions* This article defines which companies must comply with ESG due diligence requirements, including some financial firms that meet the financial thresholds. *Article 5: Due diligence* *Article 36: Review and reporting* The Commission shall submit a report to the European Parliament and to the Council on the necessity of laying down additional sustainability due diligence requirements tailored to regulated financial undertakings

	with respect to the provision of financial services and investment activities, and the options for such due diligence requirements as well as their impacts, in line with the objectives of this Directive.

Table 18: Corporate Sustainability Reporting Directive

Corporate Sustainability Reporting Directive	
Case study	**Relevant text, goals and targets**
Textile sector (with a focus on reducing the impact of the textile industry on biodiversity)	**Recital 46** "The sustainability reporting standards should therefore specify the information that undertakings are to disclose on all major environmental factors, including their impacts and dependencies on climate, air, land, water and biodiversity." **Recital 53** "For undertakings that operate in sectors particularly reliant on natural resources, sector-specific sustainability reporting standards would require the disclosure of nature-related impacts on and risks for biodiversity and ecosystems."
Finance sector (with a focus on encouraging sustainable investment behaviour in the EU)	

Table 19: Taxonomy Regulation

Taxonomy Regulation	
Case study	**Relevant text, goals and targets**
Finance sector (with a focus on encouraging sustainable investment behaviour in the EU)	**Articles 1 and 3** establish a criterion to be followed by financial institutions, to assess whether their portfolios and financial products align with the regulation. **Recital 44**: The criteria should promote appropriate governance frameworks integrating environmental, social, and governance factors [...]. **Article 9** Outlines six environmental objectives (Climate Change Mitigation; Climate Change Adaptation; Sustainable Use & Protection of Water and Marine Resources; Transition to a Circular Economy; Pollution

	Prevention & Control; Protection & Restoration of Biodiversity & Ecosystems) that financial investments must contribute to the achievement of, or avoid harm to (**Article 3**).

Table 20: Sustainable Finance Disclosure Regulation

Sustainable Finance Disclosure Regulation	
Case study	**Relevant text, goals, targets**
Finance sector (with a focus on encouraging sustainable investment behaviour in the EU)	**Article 8**: Transparency of the promotion of environmental or social characteristics in pre-contractual disclosures. **Article 10**: Transparency of the promotion of environmental or social characteristics and of sustainable investments on websites. Financial market participants shall publish and maintain on their websites the following information for each financial product referred to in Article 8(1) and Article 9(1), (2) and (3): (a) A description of the environmental or social characteristics or the sustainable investment objective; (b) Information on the methodologies used to assess, measure and monitor the environmental or social characteristics or the impact of the sustainable investments selected for the financial product, including its data sources, screening criteria for the underlying assets and the relevant sustainability indicators used to measure the environmental or social characteristics or the overall sustainable impact of the financial product. **Article 11**: Transparency of the promotion of environmental or social characteristics and of sustainable investments in periodic reports.