Version 2- Transformative Navigation Toolkit
Transformative Navigation Toolkit

Deliverable D1.3

30 April 2024

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TRANSPATH

Transformative pathways for synergising just biodiversity and climate actions

This project receives funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101081984.

Prepared under contract from the European Commission

Grant agreement No. 101081984
EU Horizon Europe Research and Innovation action

Project acronym:	**TRANSPATH**
Project full title:	**Transformative pathways for synergising just biodiversity and climate actions**
Start of the project:	November 2022
Duration:	48 months
Project coordinator:	Prof. Francisco Alpízar Wageningen University and Research - WUR https://www.wur.nl/
Deliverable title:	Transformative Navigation Toolkit
Deliverable n°:	D1.3
Nature of the deliverable:	Report
Dissemination level:	Public
WP responsible:	WP1
Lead beneficiary:	Wageningen University
Citation:	Ryan, S., Karlsson-Vinkhuyzen, S. and Schultzová, P. (2023). *Transformative Navigation Toolkit* (Version 2). Deliverable D.1.3. EU Horizon Europe TRANSPATH Project, Grant agreement No 101081984.

Due date of deliverable: Month 18

Actual submission date: Month 18

Deliverable status:

Version	Status	Date	Author(s)
2.0	Draft	30 April 2024	Sofie Ryan Wageningen University Sylvia Karlsson-Vinkhuyzen Wageningen University Pavlína Schultzová Global Change Research Institute of the Czech Academy of Sciences

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Preface

This second version of the Transformative Navigation Toolkit (TRANSPATH Deliverable 1.3 – Version 2) is the result of two methodological steps. Firstly, we made a targeted review of scientific literature and global and EU level policy in line with the second objective of TRANSPATH's first work package (WP1); "to develop a roadmap to support practitioners in developing a 'safe and just operating space' for biodiversity, climate and human rights in context-based decision-making…including designing a methodology for reflexive dialogues with stakeholders to negotiate these spaces". However, the text is also the result of discussions with partners in the other WPs of TRANSPATH, particularly WP2. During those discussions it became clear that the toolkit also needs to support not only practitioners/stakeholders but also the researchers in TRANSPATH to engage in reflexive dialogues about their work. This version of the toolkit is a first, but not yet completed effort, to increase accessibility and usefulness of it for our fellow researchers. This version is still thus primarily targeting the researchers in all WPs than the stakeholders. As the project proceeds it will be empirically tested. We will hold conversations and collect input from our colleagues on what methods they are using and why, critical reflections on those methods, lessons learned for future use etc. In its final form the toolkit will present a more succinct overarching framing and be more generally useful for enabling inclusive deliberations on safe and just operating spaces by both scientists and stakeholders in diverse contexts.

Summary

A safe and just operating space provides a vision of a world in which we all act in a way that ensures everyone's needs are met within the means of the planet. Such a world provides a major challenge to current unsustainable consumption, production, and trade systems. However, the prospect of such a world may also provide an opportunity space for diverse actors to have an open dialogue and collaboratively develop transformative pathways for synergising climate and biodiversity actions towards a safe and just future. Engaging in such a process of pathway development is demanding. It requires from both scientists and stakeholders their ability to reflect on their relationships with complex social-ecological systems, responsibilities and underlying drivers of change such as values and norms.

The Transformative Navigation Toolkit (TRANSPATH Deliverable 1.2 and 1.3) aims to support the development of so called 'safe and just operating spaces' (SJOS) for biodiversity, climate change, and human rights in context-based decision-making. This second version primarily serves the various work packages in the TRANSPATH project with knowledge as well as normative and methodological guidance on how to operationalise and open dialogue with stakeholders safe and just operating spaces, both in terms of the direction (target) to aim pathways towards and principle based guidance on assessing alternative pathways they may consider to move in that direction. The toolkit will be empirically tested and further refined during the project and in its final form aim to be more generally useful for enabling inclusive discussions on SJOSs by both scientists and stakeholders in diverse contexts.

The toolkit first introduces the SJOS concept at the global scale, drawing from both science and policy, to distill relevant climate, biodiversity, and human rights safeguards. Then, we discuss alternative approaches for operationalising the global SJOS at a range of contexts, providing guidance including relevant examples and principles drawn from science, policy, and practice. The toolkit then introduces the meaning and importance of a participatory approach to defining SJOSs and pathways leading to them, and provides a set of tools, including various methods, concepts, principles, and questions, which aim to enable both inclusive, open dialogue (also referred to as 'reflexive deliberation') and research in developing

transformative pathways towards a safe and just future. Finally, we provide some very initial ideas on possible applications of this toolkit across TRANSPATH.

List of abbreviations

BII	Biodiversity intactness index
CBAM	Carbon Border Adjustment Mechanism
CBD	Convention on Biological Diversity
CBDR	Common but differentiated responsibilities
COP	Conference of the Parties
DEAL	Doughnut Economics Action Lab
ESR	Efforts Sharing Regulation
EU	European Union
EU ETS	European Union Emissions Trading System
GBF	Global Biodiversity Framework
GHG	Greenhouse gas
IPCC	Intergovernmental Panel on Climate Change
LULUCF	Land use, Land-Use Change and Forestry
NECPS	National energy and climate plans
PA	Paris Agreement
PBs	Planetary boundaries
SACs	Special Areas of Conservation
SDG	Sustainable Development Goal
SJOS	Safe and just operating space
SPAs	Special Protection Areas
UNFCCC	United Nations Framework Convention on Climate Change

1 Introduction

The transformative navigation toolkit described in this report aims to support the development of ‘safe and just operating spaces’ (SJOSs) for biodiversity, climate, and human rights in context-based decision-making. Initially, the toolkit will primarily serve the various work packages in the TRANSPATH project with knowledge as well as guidance on how to operationalise including through internal reflection among the researchers and through open dialogue with stakeholders safe and just operating spaces, both in terms of assessing pathways and as a target to aim pathways towards. Through discussions and experiences both within the project team and with stakeholders, the toolkit will be refined over the course of the project, and in its final form aims to be more generally useful for enabling inclusive deliberations on SJOSs by both scientists and stakeholders in diverse contexts.

Figure 1 below provides a graphical outline of the report. It consists of four main sections. Firstly we define and operationalise the concept of safe and just operating spaces as it has been done in scientific literature. Secondly we summarize the global and regional/EU level policies that include implicit or explicit formulations of global SJOS to stay within. Then we discuss a set of approaches and elements for enabling the operationalisation of the global SJOS to specific empirical contexts (e.g. geographical or sectoral). We then describe, drawing on the literature, what is known about tools and conditions for enabling what we refer to as 'reflexive deliberation' on transformative pathways in the context of a SJOS. Finally, we provide some very initial ideas on possible applications of this toolkit across TRANSPATH.

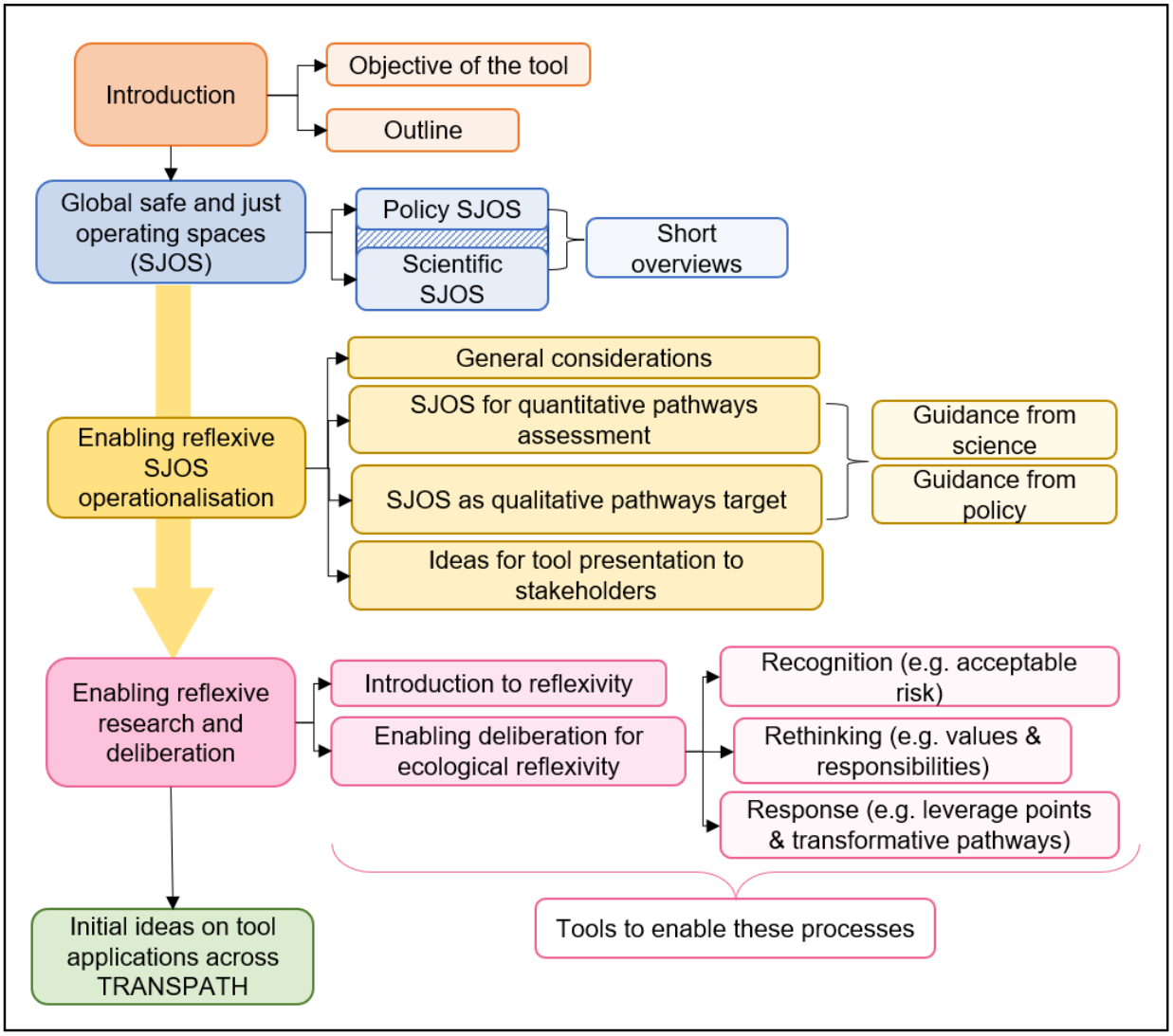

Figure 1: Outline D1.2 Transformative Navigation Toolkit. SJOS: Safe and Just Operating Space.

2 Global safe and just operating spaces

The following sections seeks to outline the boundary conditions that can help to define what may represent SJOSs in various contexts. We first define and operationalise the concept of safe and operating spaces as it has been done in scientific literature. Even such a short overview illustrates a clear distinction between the 'safe' and 'just' dimensions of the SJOS concept. The safe concept is drawing directly on natural scientific knowledge that decision-makers may draw on. The just concept is, at least in the literature referred to here, based on

negotiated goals of what the international community wants the world to look like in 2030 drawing on human rights dimensions implicitly present in the Sustainable Development Goals. While there are many normative theories on what is 'good' or 'desirable' for humans as individuals and communities developed by scholars in social science and the humanities these have not been considered in this overview. In the last sub-section we summarize the global and regional/EU level policies that include implicit or explicit formulations of global SJOS that the respective policy community has agreed as appropriate boundaries to stay within.

2.1 The safe and just operating space concept in science

The SJOS concept emphasizes that planetary health and social justice go hand in hand. The SJOS represents a desirable space for humans to operate within, and is bounded by a minimum foundation of social wellbeing, and maximum biophysical limits for maintaining an Earth system that is safe and stable for life on Earth (Figure 2).

The origin of the SJOS concept is the planetary boundaries framework(Rockström et al., 2009). This framework, as illustrated in Appendix A, presented nine global biophysical limits based on critical processes that regulate the functioning of the Earth system, within which lies the 'safe' biophysical space for humans to operate (Rockström et al., 2009; Steffen et al., 2015).

The TRANSPATH project focuses on finding actions that together can form pathways that benefit both addressing climate change and biodiversity. The planetary boundaries of climate change and biosphere integrity (formally biodiversity loss) and their interactions have been characterised as core boundaries, due to their fundamental importance for resilience through the stable operation of the Earth system (Ferretto et al., 2022; Steffen et al., 2015). As shown in Table 1 and Figure 2, the planetary boundaries for climate change and biosphere integrity have already been transgressed (Steffen et al., 2015; Stockholm Resilience Centre, n.d.), highlighting the urgent need to address these issues to maintain safe conditions for all life on Earth.

Table 1: current status of the planetary boundaries for climate change and biosphere integrity.

Earth-system process	Control variables	Planetary boundary	Current level
Climate change	Atmospheric CO_2 concentration, ppm	350 ppm CO_2	398.5 ppm CO_2
	Energy imbalance at top-of-atmosphere, W m^{-2}	+1.2 W m^{-2}	2.3 W m^{-2}
Change in biosphere integrity*	Genetic diversity: extinction rate*, extinctions per million species-years (E/MSY)	< 10 E/MSY, but with aspirational goal of ca. 1 E/MSY	100-1000 E/MSY
* Formally biodiversity loss	Functional diversity: biodiversity intactness index (BII)*	Maintain BII at 90% or above, assessed geographically by biomes/large regional areas, major marine ecosystems, or large functional groups	84% (Southern Africa only)
	* Interim control variables until more appropriate ones are developed		

Note. Adapted from "Table of the nine planetary boundaries," by the Stockholm Resilience Centre, n.d.b, (https://www.stockholmresilience.org/research/planetary-boundaries/quantitative-evolution-of-boundaries.html).

In 2012, Raworth expanded the planetary boundaries or 'safe operating space' framework with a minimum social foundation, comprising 11 (later to become 12) dimensions of human rights, including for example food, health, and education (for full list see Appendix B), based on the

Sustainable Development Goals (Raworth, 2012; Raworth, 2017). The combination of the planetary boundaries and social foundation stresses that the planetary and social boundaries are interdependent, and led to the 'safe and just operating space', also known as the doughnut model, as shown in Figure 2 (Raworth, 2012; Raworth, 2017).

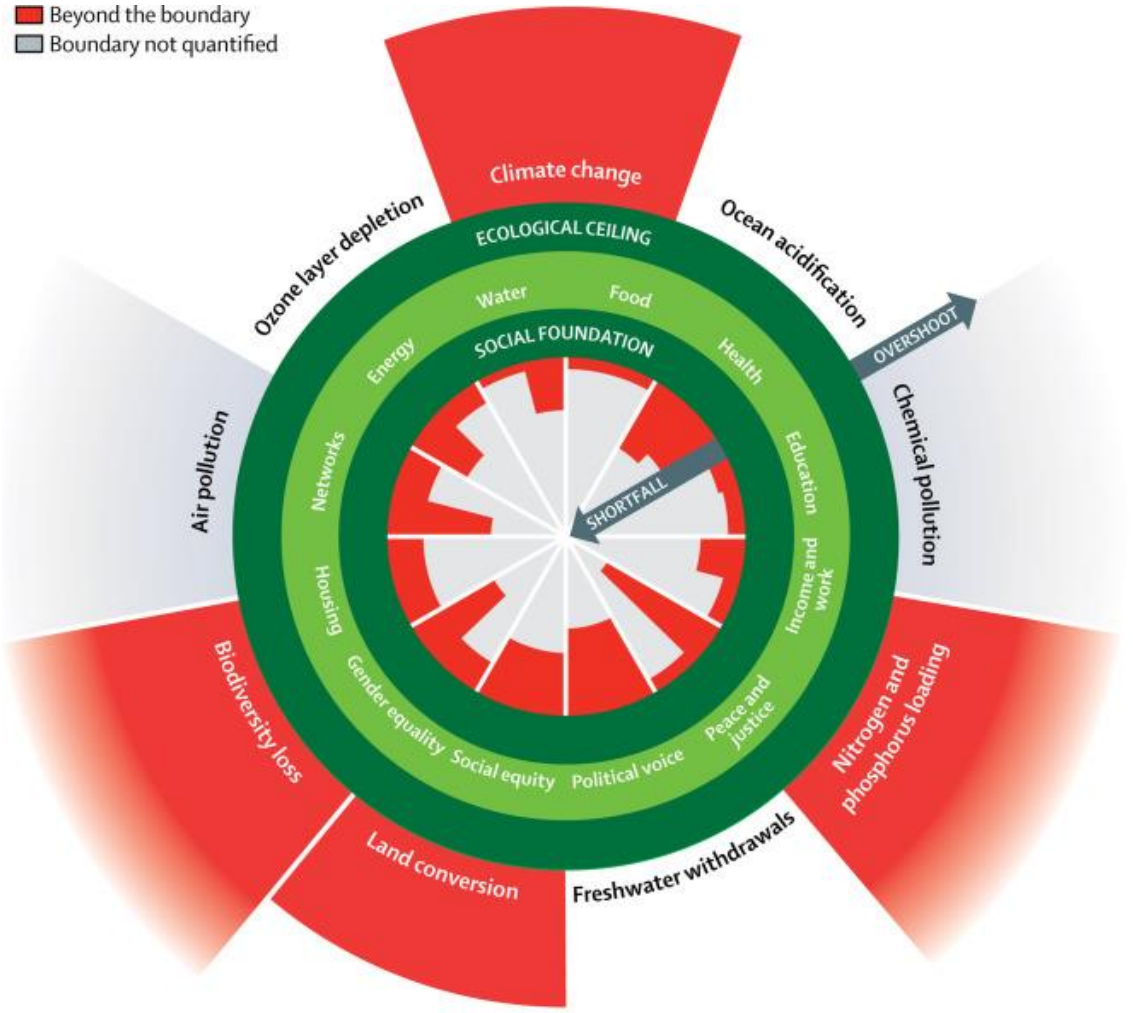

Figure 2: Shortfalls and overshoot in the Doughnut.

*Note. F*rom "A Doughnut for the Anthropocene: humanity's compass in the 21st century" by Raworth, 2017, *The lancet planetary health*, *1*(2), p. 48 (https://doi.org/10.1016/S2542-5196(17)30028-1). CC BY 4.0.

Figure 3 represents the SJOS as the light green ring on the compass, which visually illustrates that on the global scale we are currently straying far from the safe and just operating space (Raworth, 2017). Not only is human activity overshooting several planetary boundaries, including climate change and biosphere integrity, but due to deep inequalities, the social foundation is being undershot, with millions lacking access to the acceptable standards including on health, food, and equity (Raworth, 2017).

2.2 Safe and just operating spaces in global climate and biodiversity policies

As scientists in the last half of the 20th Century started to see changes in the environment caused by human actions and understood their implications for both planet and people, societies took note and policies started to slowly follow both at national and international level.

International treaties for the protection of very specific biodiversity threats were adopted from the 1970s onwards such as addressing illegal trade in species, protecting migratory species and important ecosystems such as wetlands. The awareness of human-driven climate change took longer to move to the policy tables, but so did approaching biodiversity loss as a systemic problem linked to how we build our communities, how we feed them, etc. Global biodiversity loss and climate change reached the global policy limelight at the same moment. In 1992 at the United Nations Conference on Environment and Development in Rio de Janeiro the foundational framework treaty for each respective issue were adopted; the United Nations Framework Convention on Climate Change (UNFCCC) and the Convention on Biological Diversity (CBD). The respective objectives of these treaties can each be viewed as the safe space that the international community of states aspire towards reaching for climate and bioidversity, illustrated below by the article in each convention that provides the overaching objective (highlights added):

Table 2: Objectives of global climate and biodiversity framework treaties

UNFCCC objective (article 2)	CBD objective (article 1)
The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.	The objectives of this Convention, to be pursued in accordance with its relevant provisions, are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.

For **climate change** the safe space is when the stabilization of greenhouse gases in the atmosphere stays at a level that avoids ‘dangerous climate change’. What is counted as dangerous is not specified in the UNFCCC text but over time the objective has been further specified, based on both further research as summarized by the Intergovernmental Panel on Climate Change (IPCC) and political negotiations (see below). For **biodiversity,** as captured in the CBD, the safe and just space is stopping the extinction of species, using biodiversity in a way that does not diminish it over time and sharing the benefits of using genetic resources fairly and equitably.

The UNFCCC and CBD thus moves a good way to define safe clearly with humans as the core benchmark for whose safety should be ensured, it is our interdependence on the biophysical world that is the prime driver for pushing forward these policies. There is thus an underlying coherence with the objective of the human rights policies described in the following section. But beyond that by referring to the fair sharing of resources the biodiversity goal includes a dimension of **justness** and while the climate change goal does not refer to the justice dimensions other provisions of the UNFCCC and subsequent agreements do reference to equity. However, it is primarily **intrageneral equity among states** that is referred to stressing the division of countries reaching material affluence early while using cheap fossil fuels or degrading their farmlands and forests and countries still striving to achieve material affluence for a broader set of its population many of which still in a historic context have had

a relatively small contribution to greenhouse gas emissions or biodiversity loss, a division which also is manifested through different levels of capacity to take action.

These overarching objectives formulated more than thirty years ago remain as guideposts for the subsequent work towards implementation of these agreements, work which includes the adoption of additional legal and non-legal instruments. Their operationalisation has also in the last few years increasingly included references to the mutual interdependence of climate change and biodiversity and started to provide guidance on possible measures to develop synergistic approaches for addressing them. These instruments have in some cases provided more ceilings/objectives that are formalised by the international community. In other cases they have added more aspirational or inspirational visions for what good and desirable world should look like that goes beyond the baseline of 'safe'. We provide examples of both when discussing climate change and biodiversity in more detail below. What these agreements are not doing is addressing the underlying drivers for biodiversity loss or climate change, such as worldviews, values and norms that favour gross inequalities, excessive consumption, predatory business practices and a general favouring of a narrow now and us instead of a generous then and them becoming included.

2.2.1 Climate change

Under the UNFCCC the most important additions were the legally binding instruments the Kyoto Protocol adopted in 1997 and entered into force in 2004, and the Paris Agreement adopted in 2015 and entered into force in 2016. The Kyoto Protocol referred only to the ultimate objective of the UNFCCC (see above), while the PA specified the objective further, both as a quantitative temperature goal and more specific adaptation and finance goals:

Table 3: Objective of the Paris Agreement (article 2)

This Agreement, in enhancing the implementation of the Convention, including its objective, aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by: (a) Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change; (b) Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production; (c) Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development. 2. This Agreement will be implemented to reflect equity and the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.

The translation of the qualitative objective in the UNFCCC into a temperature goal (the range 1.5-2.0 in the PA) was a long process, influenced by science but initiated and anchored in politics. The politically negotiated temperature targets, in turn, strongly influenced the work of both the science and policy communities.

Each annual Conference of the Parties (COPs) to the climate treaties adopts decisions that are also intended to guide the Parties. These are, in most cases, considered not legally binding (soft law/recommendations). However, the Paris Agreement integrated a five-year cycle of assessing collective progress towards the objectives of the treaty, and the outcome of this so-called global stocktake has to inform each country's subsequent new five-year climate plan.

The outcome of the first global stocktake was adopted in December 2023 at COP28 and the 21 pages of decision-text: reiterates the SJOS of the Paris Agreement ("resolves to pursue efforts to limit the temperature increase to 1.5 °C"); provides clear statements of the required acceleration in a range of actions; and the principles that need to guide that action in order to ensure both effective and just results. Table 4 contains a selection of global stocktake decision-text relevant for the climate change, biodiversity and justice domains.

Table 4: Actions and principles in the global stocktake decision

"…the importance of ensuring the integrity of all ecosystems, including in forests, the ocean, mountains and the cryosphere, and the protection of biodiversity, recognized by some cultures as Mother Earth…the importance of 'climate justice', when taking action to address climate change…urgent need to address, in a comprehensive and synergetic manner, the interlinked global crises of climate change and biodiversity loss in the broader context of achieving the Sustainable Development Goals…"
"…accelerate action in this critical decade on the basis of the best available science, reflecting equity…"
"…limiting global warming to 1.5 °C with no or limited overshoot requires deep, rapid and sustained reductions in global greenhouse gas emissions of 43 per cent by 2030 and 60 per cent by 2035 relative to the 2019 level and reaching net zero carbon dioxide emissions by 2050…"
"…limiting global warming to 1.5 °C with no or limited overshoot requires deep, rapid and sustained reductions in global greenhouse gas emissions of 43 per cent by 2030 and 60 per cent by 2035 relative to the 2019 level and reaching net zero carbon dioxide emissions by 2050…"
"…carbon budget consistent with achieving the Paris Agreement temperature goal is now small and being rapidly depleted and acknowledges that historical cumulative net carbon dioxide emissions already account for about four fifths of the total carbon budget for a 50 per cent probability of limiting global warming to 1.5 °C…
"…climate change is a common concern of humankind and that Parties should, when taking action to address climate change, respect, promote and consider their respective obligations on human rights, the right to a clean, healthy and sustainable environment, the right to health, the rights of Indigenous Peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations and the right to development, as well as gender equality, empowerment of women and intergenerational equity."
"…adaptation and mitigation financing…need to increase manyfold, and…there is sufficient global capital to close the global investment gap but there are barriers to redirecting capital to climate action, and that Governments through public funding and clear signals to investors are key in reducing these barriers and investors, central banks and financial regulators can also play their part…"
"…the importance of conserving, protecting and restoring nature and ecosystems towards achieving the Paris Agreement temperature goal, including through enhanced efforts towards halting and reversing deforestation and forest degradation by 2030, and other terrestrial and marine ecosystems acting as sinks and reservoirs of greenhouse gases and by conserving biodiversity, while ensuring social and environmental safeguards, in line with the Kunming-Montreal Global Biodiversity Framework"
"…the implementation of integrated, multi-sectoral solutions, such as land-use management, sustainable agriculture, resilient food systems, nature-based solutions and ecosystem-based approaches, and protecting, conserving and restoring nature and ecosystems, including forests, mountains and other terrestrial and marine and coastal ecosystems…building on the best available science as well as Indigenous Peoples' knowledge and local knowledge systems;
"…sustainable and just solutions to the climate crisis must be founded on meaningful and effective social dialogue and participation of all stakeholders…"

> "…just transitions can support more robust and equitable mitigation outcomes, with tailored approaches addressing different contexts…"

Source: COP28 decision text in document FCCC/PA/CMA/2023/L.17.

As shown in Table 4 the global stocktake highlights: the need for urgent (in this decade) acceleration in climate action; how developed countries have used up most of the available carbon budget for achieving 1.5 degrees; how big the need is for finance which is available but not yet channeled to where it is needed due to various barriers; how important it is to address climate and biodiversity and ecosystem health in an integrated manner both for adaptation and mitigation; how much more can be achieved if the required transitions in society can be done in a just way tailored to diverse contexts; how important it is to go about change based on broad social dialogue and participation and to include knowledge of indigenous peoples and local communities in addition to the best available science. This (and much more) provides ample guidance not only for national governments as they develop their future climate plans but also for other stakeholders anxious to take responsibility and step up action.

2.3 Biodiversity

Global policy on biodiversity has worked with ten year strategic plans to implement the objectives of biodiversity conservation, the last two of which formulated a set of time-bound goals. The second strategic plan adopted in 2010 contained four goals and 18 Aichi targets to be achieved in 2020 (of which none were achieved). In 2022 the Kunming-Montreal Global Biodiversity Framework was adopted by all Parties to the CBD with four goals and 23 targets that were intended to support achieving the vision of a world of living in harmony with nature where: "By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people"(CBD para 28). The CBD set the year 2030 as an important goalpost towards the 2050 vision, one where urgent action is taken and biodiversity loss is reversed putting "nature on a path to recovery" (CBD para 29).

Some of the most pertinent goals and targets for the work of TRANSPATH are summarized in the two tables below. A number of the targets under goal A – Conservation – are addressing the core causes, or drivers, of biodiversity loss as identified by the Global Biodiversity Assessment (IPBES, 2019). The targets under goal B – Sustainable Use and Contributions – focus more on how to ensure sustainable use of nature and that its benefits reach all people. These targets are not quantitative as described in the table below.

Table 5: Conservation and Related Targets.

GOAL A CONSERVATION	RELATED TARGETS
The integrity, connectivity and resilience of all ecosystems are maintained, enhanced, or restored, substantially increasing the area of natural ecosystems by 2050;	1. Biodiversity inclusive spatial planning-all areas All areas are under participatory integrated biodiversity inclusive spatial planning and/or effective management processes addressing land and sea use change… 2 - Restoration By 2030 at least 30 percent of areas of degraded terrestrial, inland water, and coastal and marine ecosystems are under effective restoration…. 3 Protecting land 30 by 30 By 2030 at least 30 percent of terrestrial, inland water, and of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem functions and services, are effectively conserved and managed ....

Human induced extinction of known threatened species is halted, and, by 2050, extinction rate and risk of all species are reduced tenfold and the abundance of native wild species is increased to healthy and resilient levels; • The genetic diversity within populations of wild and domesticated species, is maintained, safeguarding their adaptive potential.	4 – Halt species extinction Halt human induced extinction of known threatened species and for the recovery and conservation of species, in particular threatened species… 5 –Extraction of wild species as driver Ensure that the use, harvesting and trade of wild species is sustainable, safe and legal… while respecting and protecting customary sustainable use by indigenous peoples and local communities. 6 – Invasive species - driver Eliminate, minimize, reduce and or mitigate the impacts of invasive alien species on biodiversity and ecosystem services … 7 – Reduce pollution - driver Reduce pollution risks and the negative impact of pollution from all sources, …, including: reducing excess nutrients lost to the environment by at least half …; reducing the overall risk from pesticides and highly hazardous chemicals by at least half … 8 – Climate change - driver Minimize the impact of climate change and ocean acidification on biodiversity and increase its resilience through mitigation, adaptation, and disaster risk reduction actions, including through nature-based solution and/or ecosystem-based approaches, while minimizing negative and fostering positive impacts of climate action on biodiversity.

Countries are obliged to submit National Biodiversity Strategy and Action Plans (NBSAPs) to the CBD where they lay out how they seek to implement the goals and targets. They are expected to submit revised NBSAPs during 2024 where they also describe how much they aim to contribute to the targets of the Kunming-Montreal Global Biodiversity Framework.

Table 6: Sustainable Use and Contributions and Related Targets.

GOAL B SUSTAINABLE USE & CONTRIBUTIONS	RELATED TARGETS
Biodiversity is sustainably used and managed and nature's contributions to people, including ecosystem functions and services, are valued, maintained and enhanced, with those currently in decline being restored…	9 Sustainable use Management and use of wild species are sustainable… and protecting and encouraging customary sustainable use by indigenous peoples and local communities. 10 Sustainable production – agriculture etc. Areas under agriculture, aquaculture, fisheries and forestry are managed sustainably… including through a substantial increase of the application of biodiversity friendly practices, such as sustainable intensification, agroecological and other innovative approaches 11 – Nature's contributions to people Restore, maintain and enhance nature's contributions to people…through nature-based solutions and/or ecosystem-based approaches for the benefit of all people and nature.

	12 - Urban biodiversity Significantly increase the area and quality and connectivity of, access to, and benefits from green and blue spaces in urban and densely populated areas sustainably, by mainstreaming the conservation and sustainable use of biodiversity, and ensure biodiversity-inclusive urban planning, enhancing native biodiversity, ecological connectivity and integrity, and improving human health and well-being and connection to nature and contributing to inclusive and sustainable urbanization and the provision of ecosystem functions and services.

2.4 Human rights and justice

Ensuring people access to their human rights constitutes a fundamental prerequisite for building just societies. A global outlook may evoke a rather bleak conclusion on the level of equity and justice in the world, among countries and within countries including the degree to which human rights are secured by states. However, taking a long historical view of humanity's development we have made great strides in the past 100 years towards both establishing collectively what rights and forms of justice individuals (and to some degree communities) should enjoy. The adoption of the Universal Declaration of Human Rights in 1948 and its subsequent codification of these rights into legally binding treaties set off a norm diffusion that has given countless people access to basic forms of human rights.

The human rights are clustered together into two groups: civil and political rights, and economic, social and cultural rights. Civil and political rights cover issues such as equality before the law; the right to a fair trial, participation in public affairs and elections; and protection of minority rights. Economic, social and cultural rights include rights to an adequate standard of living, physical and mental well-being and the benefits of scientific progress. Also highly relevant that the UN General Assembly in 2022 adopted a resolution that declares access to a clean, healthy and sustainable environment, a universal human right. This means that the very nature of international human rights law will change and that peoples' strategies towards governments regarding cleaning up the environment can change from begging to demanding.[1] Even before this addition of the right to a clean environment, there are several examples of court cases regarding demanding more climate action where the verdicts have relied on human rights law (United Nations Environment Programme 2023).

While neither the UNFCCC, the Kyoto Protocol, the Paris Agreement or the CBD contains any references to human rights there have been references made to human rights in recent years in preambles — thus not in the decision text — of UNFCCC COP decisions, at least from COP21 onwards:

> "Acknowledging that climate change is a common concern of humankind, Parties should, when taking action to address climate change, respect, promote and consider their respective obligations on human rights, the right to health, the rights of indigenous peoples local communities, migrants, children, persons with disabilities and people in vulnerable situations and the right to development, as

[1] See https://news.un.org/en/story/2022/07/1123482

> well as gender equality, empowerment of women and intergenerational equity " (Preamble CP.21) -

Preambles are not generally considered to give "rise to any particular rights or obligations under international law" but they can e.g. help to determine what the aims of a treaty are (Klabbers, 2018). Preambles of COP decisions, decisions which in themselves are only soft law and thus only morally binding, have even less standing but advocates still work hard to include references to human rights in the preambles.

Both the climate and biodiversity agreements are directly concerned with justice with respect to fairness in allocating responsibility and securing benefits between countries with different socio-economic status. A strong guiding principle for the former has been the common but differentiated responsibilities and respective capabilities (CBDR) principle that awards a shared responsibility for all countries to take action but a higher responsibility for those with a larger role in causing the damage and having more resources and capacity (developed countries) to address the problem. In the Paris Agreement the CBDR is still relevant but has become more nuanced as the strict division between developed and developing countries is less prominent. The agreement explicitly refers implementation to be carried out "…on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty" (Paris Agreement article 4.1).

In the CBD the primary reference relevant for justice is in the objective that the benefits arising from using genetic resources should be fairly and equitably shared (article 1) which also is further elaborated to encompass the biotechnologies developed based on those resources. The CBD also encourages the equitable sharing of "benefits arising from the use of traditional knowledge, innovations and practices…". The Kunming-Montreal Global Biodiversity Framework adds several more aspects to equity/justice. It explicitly refers, for example, to that its implementation should be guided by the principle of intergenerational equity, equitable governance and equitable participation and representation.

Socio-economic rights as defined in the UN Declaration and associated conventions about securing the minimum needs of e.g. food, shelter etc. for people to live a life of dignity. They do not cover any form of distributional justice or set out objectives of societal equity. The Agenda 2030, in contrast, explicitly envisions a future world where human rights and justice reigns. Goal 16 also explicitly includes access to justice for all and in Goal 10 is about reducing inequality within and among countries. The targets under this SDG are focused on increasing both income and opportunities for those who have as yet been underprivileged but also to "[a]dopt policies, especially fiscal, wage and social protection policies, and *progressively achieve greater equality*" SDG 10.4 (emphasis added). Thus while the emphasis is on reducing inequality by elevating the lower end of the population – this target could be taken to include policies that could target any end of the equality spectrum, also the very high end.

Goal 16 has two targets that are particularly relevant for environmental policy making:

> Promote the rule of law at the national and international levels and ensure equal access to justice for all (16.3)
>
> Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements (16.10)

In the context of the environmental policy domains there is already an international treaty that serves these purposes, the Aarhus Convention, which the EU and its member states are signatories of. Its objective is:

> "In order to contribute to the protection of the right of every person of present and future generations to live in an environment adequate to his or her health and well-being, each Party shall guarantee the rights of access to information, public

> participation in decision-making, and access to justice in environmental matters in accordance with the provisions of this Convention."

The Aarhus Convention thus connects at a fundamental level the civil and political rights with the economic, social and cultural rights as these have now been expanded to include a clean, healthy and sustainable environment. But clearly there are gains to be won beyond the individual's rights here with the prospective of more justice in communities and the contribution this would bring to society as whole.

2.5 SJOSs in EU climate and land-based biodiversity policies

In the following sections we provide a short overview of how SJOSs are implicitly reflected in EU climate and land-related biodiversity policies, those policies that are developed most explicitly to address these two major dimensions of environmental degradation. It is in these policies we could expect to most clearly see evidence of a recognition of societies' impact on nature and the need to keep within SJOS. Just as for global policies, there are in these policies a strong bias towards addressing direct drivers, the physical activities that cause harm whether greenhouse gas emissions or land degradation, to take two examples. And even if the EU has explicitly endorsed a principle such as 'policy coherence for sustainable development' (SDG 17.14) and the Green Deal, clearly many other EU policies are very relevant for the ability to effectively address climate change and biodiversity loss, not the least trade and finance policies that constitute a strong focus in TRANSPATH. The purpose here, however, is not to identify the most effective leverage points for transformative pathways (that is the task of other deliverables of TRANSPATH)– but rather support inclusive dialogue on SJOSs in various contexts. A basic awareness of if and how EU policies have considered these is, in our view, relevant for this. Importantly, the text below includes some but likely all policy developments in the late spring of 2024 when political developments moved to drop or significantly downgrade a number of particularly land-relevant policies on nature and agriculture.

2.5.1 Climate policies – EU level

The European Union has been one of the pushers of ambitious international climate goals, it was a strong supporter of the Kyoto Protocol and subsequently the Paris Agreement. It has in recent years followed through with increasingly strong action 'at home'. The European Green Deal that was proposed in December 2019 includes a goal for the whole of EU to reach climate neutrality by 2050 (European Parliament, 2024d). This goal has become part of the European Climate Law that entered into force in July 2021 which also includes an interim legal obligation to reduce EU wide emissions by 55% compared to 1990 levels by 2030 (European Parliament, 2024b). The Climate Law also establishes a European Scientific Advisory Board on Climate Change which will provide independent scientific advice and reporting on EU climate measures. On February 6th 2024, a communication for the EU climate target for 2040 (required by the Climate Law) was published, aiming to achieve a 90% net greenhouse gas emissions reduction by 2040 in comparison with 1990 (European Parliament, 2024a). A whole package of revised legislation in a number of sectors was adopted in April 2023 under the name "Fit for 55" in order to support the implementation of the climate law. Figure 3 and Table 7 below provide overviews of the new policies and targets per sector.

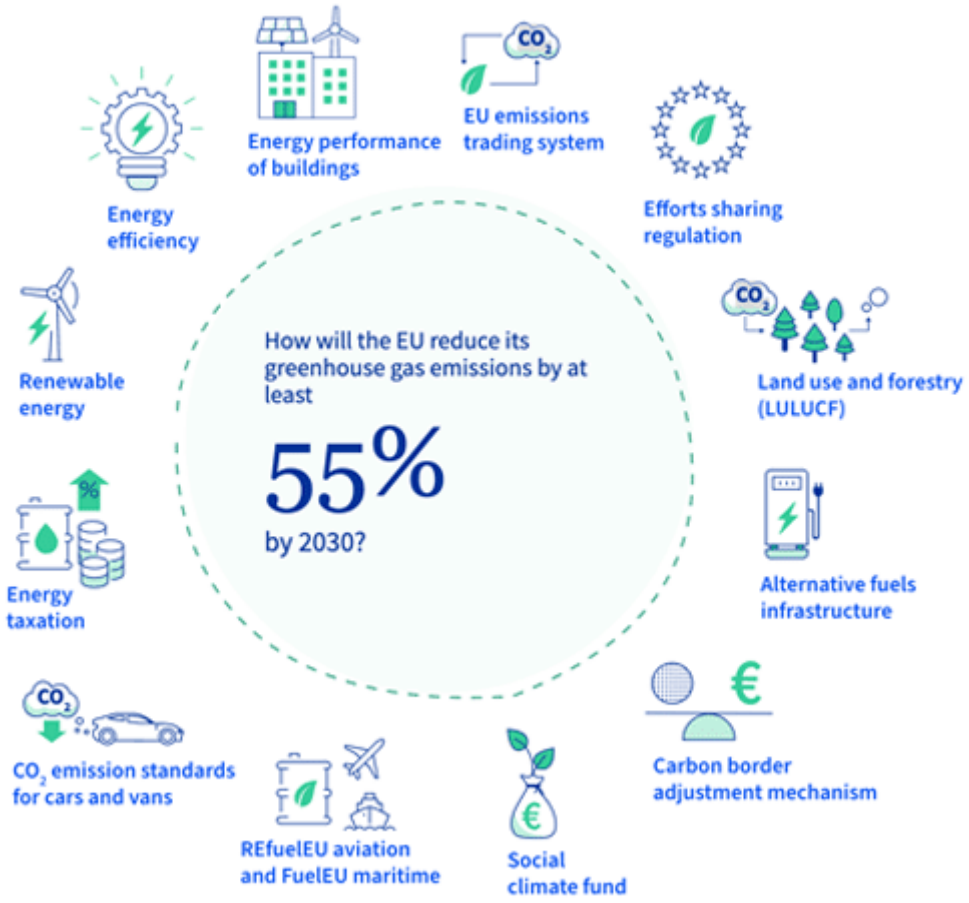

Figure 3: Overview of EU climate policies.

Note. From "Fit for 55 - The EU's plan for a green transition," European Council, 2023 (https://www.consilium.europa.eu/en/policies/green-deal/fit-for-55-the-eu-plan-for-a-green-transition/).

Table 7. Overview of EU climate policies including targets per sector.

Regulation	Description	Status & Additional Notes
EU emissions trading system (ETS) reform	Proposed reform: 1. An **increase** of the overall ambition of **emissions reductions by 2030** in the sectors covered by the **EU ETS to 62%**, compared to the 61% target proposed by the Commission; 2. **Faster reduction of the cap[2], fewer allowances** on the market (reduction of 117 million allowances over two years): -4.3% per year (2024-2027), -4.4% per year (2028-2030); 3. **Cover new sectors**: extension to maritime transport, a separate new ETS for buildings, road transport and fuels for additional sectors; 4. Gradual **phasing out of free allowances for certain sectors** + introduction of the carbon border adjustment mechanism; 5. **Increased funding** for decarbonising ETS sectors; 6. **Up to 65 billion EUR to address the carbon pricing impact** of the proposed ETS for buildings and road transport and fuels for additional sectors	Adopted
Efforts sharing regulation (ESR)	Revised regulation: the EU aims to **reduce the GHG emissions of concerned sectors by 40%** (existing target: -29%). Sets a target for each member state to cut GHG emissions in road transport, agriculture, buildings, small industries, and waste (makes up 60% of total GHG emissions in the EU).	Adopted
Land use, land-use change and forestry (LULUCF)	Existing target: -225 Mt Level of removals in 2019: -249 Mt (source: EEA) **New 2030 target: -310 Mt** * Mt=Million tonnes of CO2 equivalent Two-phase approach: Phase 1 **until 2025**: the current system remains largely in place, with the obligation for each member state to balance emissions and removals. Phase 2 from **2026-2030**: a new EU-level target for net removals of **310 Mt**, with member states' targets for net removals contributing to the increased ambition.	Adopted
Alternative fuels infrastructure regulation	E.g., **Road transport - Recharging stations**:- at least every **60 km** on main roads- by the end of 2025 for passenger cars and trucks below 3.5 tonnes- by the end of 2030 for trucks above 3.5 tonnes- every year, total power output provided through recharging stations should grow with the number of registered passenger cars and trucks below 3.5 tonnes**For trucks above 3.5 tonnes**:- at least one recharging station in each safe and secure parking area (end of 2030)- recharging stations also in urban areas. Also concerns ports and airports...	Adopted; The goal of the regulation is to ensure that there is enough infrastructure for cars, trucks, ships and planes to (re)charge or (re)fuel with alternative fuels (e.g. hydrogen, liquefied methane) with good enough coverage across the

[2] A cap "is a limit set on the total amount of greenhouse gases that can be emitted by the installations and aircraft operators covered by the system" (European Commission, 2024).

		Union as to avoid range anxiety.
Carbon border adjustment mechanism (CBAM)	For production outside of the EU, **EU importers** will have to **buy CBAM certificates** to cover price difference coming from ETS allowances that producers in the EU have to use to cover their CO2 emissions (reduces carbon leakage).	Adopted; The CBAM is a new regulation creating incentives for non-EU producers to reduce emissions.
Social climate fund	The fund will **help tackle energy poverty** and **improve access to zero- and low-emission mobility and transport** in the EU. Budget: up to €65 billion of funding to member states for 2026-2032	Adopted; The social climate fund is a new tool for financially **supporting people and businesses most impacted** by the introduction of a new emissions trading system for buildings, road transport and fuels for additional sectors.
Refuel EU aviation and FuelEU maritime regulation	**The ReFuel aviation regulation:** The minimum share of supply of sustainable aviation fuels will be as follows: 2025: 2%, 2030: 6%, 2035: 20%, 2040: 32%, 2045: 38%, 2050: 63%. **The FuelEU maritime regulation** will oblige vessels above 5 000 gross tonnes calling at European ports (with exceptions such as fishing ships): to reduce the greenhouse gas intensity of the energy used on board as follows: 2025: 2%, 2030: 6%, 2035: 13%, 2040: 26%, 2045: 59%, 2050: 75%	Adopted
EU methane regulation for the energy sector	Improving and enforcing **stricter rules** on the **monitoring and reporting of emissions** in the energy sector. The new regulation will also achieve **immediate emissions reductions** by restricting the release of methane into the atmosphere in fossil fuels plants.	Provisional agreement by the co-legislators
CO2 emissions standards for cars and vans	**Projected CO2 emission reductions for new cars and vans:** **2021** - limit of 95 g/km for cars and 147 g/km for vans **2030** – 55% reduction for cars and 50% for vans (compared to the 2021 targets) **2035** - 100% reduction for cars and vans	Adopted; The regulation increases the CO2 emission reduction targets for 2030 and sets a **new target of 100% for 2035**.
Energy taxation	What can be **expected to change** under the current proposal?: - The **most polluting fuels (coal, oil, gas)** would be taxed the highest - **Aviation and maritime fuels** would be subject to taxation - **No distinction between types of use** of fuels and electricity (commercial vs non-commercial, business vs non-business use) - **Continuous updating of minimum rates** (adjusted annually, based on Eurostat consumer prices figures)	Under discussion within the Council
Renewable energy directive	What will change with a **new directive approved by the European Council in 2022**? The new 2030 EU target will almost double the current	Adopted

	share of renewable energy in the EU, bringing it to 40% of the total energy consumption. This means that **the EU as a whole plans that, by 2030, at least 40% of all its used energy will come from renewable sources**. Current 2030 target: at least 32% share **New 2030 target: at least 40% share** **At national level:** Each member state has to contribute to reaching the goal set for renewable energy. **Countries have set their 2030 national goals for renewables in their national energy and climate plans (NECPs)**.	
Energy efficiency directive	The **new targets are -40.6% for primary consumption (indicative target) and 38% for final consumption (mandatory target)**. Under the new rules approved by the Council in June 2022, member states will have to gradually increase their energy savings from 2024 to 2030. **The end-use energy savings will on average account for 1.49% of the total consumption per year, gradually reaching 1.9% by the end of 2030**.	Adopted; So far, the EU achieved a reduction of 29% on average (compared to 2030 estimates done in 2007). The current reduction targets are -32.5% for both primary and final consumption.
Energy performance of buildings directive	**By 2050, buildings in the EU should be zero-emission buildings**. New buildings that will have to be zero-emission: - as of 2028 - new buildings owned by public bodies - as of 2030, all new buildings As of 2030, energy performance certificates will be obligatory for all new buildings. As of 2050, all existing buildings should be transformed into zero-emission buildings	Provisional agreement by the co-legislators

Note. Adapted from "Fit for 55 - The EU's plan for a green transition," European Council, 2023 (https://www.consilium.europa.eu/en/policies/green-deal/fit-for-55-the-eu-plan-for-a-green-transition/).

2.5.2 EU Biodiversity policies

One of the most essential pillars of biodiversity protection in the European Union is currently represented by the EU's biodiversity strategy for 2030, adopted in May 2020 by the European Commission. The objective of this long-term strategic plan is "to protect nature and reverse the degradation of ecosystems" while putting "Europe's biodiversity on a path to recovery by 2030 for the benefit of people, climate and the planet" (European Commission, Directorate General for Environment, 2021). Besides that, the EU biodiversity strategy plays a crucial role in the European Green Deal and its implementation. By the year 2030, the strategy aims to fulfil the following commitments and actions: protect and restore nature, enable transformative change, and support biodiversity globally (European Commission, Directorate General for Environment, 2021).

According to the strategy, the EU set a goal to enlarge the existing protected areas included in Natura 2000 while strictly protecting high biodiversity areas. Also, the EU will launch a nature restoration plan in order to restore degraded ecosystems, which all EU members will be required to implement in their respective countries. The idea was that this plan would be enforced by the Nature Restoration Law (see below). To enable such extensive transformative change, it is necessary to introduce measures concerning better financing and investments, research (e.g., supporting a biodiversity-focused research agenda of the Horizon Europe programme), and a biodiversity governance framework, aiming to keep track of commitments and requirements related to biodiversity goals while also creating a roadmap on how to

implement them effectively with a set of indicators necessary for further strategy progress assessments (European Commission, Directorate General for Environment, 2021). Lastly, the strategy also focuses on biodiversity from the global perspective and aims to make the EU a leader in the biodiversity crisis (European Commission, 2020b). Specific goals and targets are listed in the table below with also cross-reference to which KMGBF target they contribute to.

Table 8: Specific goals in the EU 2030 Biodiversity Strategy (European Commission, 2020)

	Specific goal	**Global Biodiversity Framework goal/target**
Establish protected areas for at least:	**30% of land** in Europe	3
	30% of sea in Europe	3
	Strictly protecting at least a third of the EU's protected areas, especially the remaining EU primary and old-growth forests	
Restore degraded ecosystems at land and sea across the whole Europe by:	**Increasing organic farming** and biodiversity-rich landscape features on agricultural land	2
	Halting and reversing the **decline of pollinators**	4/11
	Restoring at least 25 000 km of EU **rivers to a free-flowing state**	2
	Reducing the use and risk of **pesticides by 50% by 2030**	7
	Planting **3 billion trees by 2030**	2/8
Improve financing by:	Unlocking **20 billion EUR/year for biodiversity** through various sources, including EU funds, national, and private funding. Natural capital and biodiversity considerations will be integrated into business practices.	19

Note: Information has been added on which targets in the KMGBF the specific goals in the EU Biodiversity Strategy is relevant for.

To turn the EU's biodiversity strategy goals into legally binding targets, the European Commission has proposed a Nature Restoration Law in June 2022. The proposal's targets clearly align with those of the EU's biodiversity strategy, aiming "to restore ecosystems, habitats and species across the EU's land and sea areas" (European Commission, 2023i). The specific targets of the Nature Restoration Law include the following: improving and enlarging biodiverse habitats, which are currently protected under existing legislation (e.g., wetlands, forests, rivers and lakes); halting the decline of pollinating insect populations by 2030 and aiming to increase their populations; supporting forest ecosystems by promoting forest connectivity, unevenly aged forests, organic carbon stock, and increasing the abundance of standing and lying deadwood; increasing green urban space by 2040; enhancing the populations of grassland butterflies and farmland birds in agricultural ecosystems, increasing organic carbon stock and high-diversity landscape features across agricultural land; restoring marine habitats (e.g., seagrass beds, sediment bottoms); promoting river connectivity by removing barriers and achieving the goal of at least 25 000 km of rivers to a free-flowing state by 2030.

Due to significant amendments requested by the Members of the EP to the proposal's content (e.g., exception for restoring agroecosystems and delay of the law's implementation), the European Parliament adopted a favorable position towards the proposal on July 12th 2023 (European Parliament, 2023). In November 2023 a provisional agreement on the Nature Restoration Law was reached within the trilogue negotiations (European Parliament, 2024b). However, even this altered version that contains many exceptions and concessions, was not acceptable to the necessary number of Member States in the EU Council. During spring 2024 a number of countries withdraw their support and its fate after the EU elections in June is unclear. The overall progress of the EU and its Member States in reaching the Strategy's targets is shown on the EU Biodiversity Strategy Dashboard. For example, one of the most crucial targets for 2030 – reaching a minimum of 30% of protected EU's land area – is shown to be almost fulfilled, currently being at 26% (European Commission, 2023c).

The European Union has also implemented specific biodiversity policies, the oldest ones being the Birds and Habitats Directives, which later laid the foundation for Natura 2000, an essential environmental policy. The Birds Directive (Directive 79/409/EEC), the first biodiversity legislation, was adopted by the EU in 1979 and it "requires all Member States to protect all wild bird species and protect and restore their habitats" (Directorate-General for Environment (European Commission) et al., 2014). This directive constitutes two main measures. Firstly, all wild bird species must be protected, including their eggs and nests. It is also required that all Member States ban any deliberate capture or killing of birds in the wild, disturbance (especially during breeding), destruction of nests and eggs, and keeping or selling wild bird species. Secondly, all wild bird species habitats must be protected and restored to promote the diversity and area of habitats. As for threatened bird species, "Member States must classify Special Protection Areas (SPAs) for 197 species and sub species listed in Annex I of the Birds Directive, as well as for other migratory birds" (Directorate-General for Environment (European Commission) et al., 2014). SPAs together with Special Areas of Conservation (SACs), which are an essential part of the Habitats Directive, create the Natura 2000 network.

The second oldest biodiversity legislation, the Habitats Directive, was adopted in 1992 and demands a strict protection for species listed in Annex IV by all EU countries. Such protection involves prohibiting the following: any deliberate capturing or killing of wild species; deliberate disturbance, particularly during breeding, migration, etc.; destruction of breeding or resting sites, nests or eggs, or the picking, uprooting or destruction of protected wild plants; capturing or killing leading to serious population disturbances; and the keeping, transport, and sale of wild specimens (Directorate-General for Environment (European Commission) et al., 2014). Habitat types listed in Annex I are also required to be properly identified and protected by all EU countries. Sites that are identified as important for species and habitat protection are then designated as the so called Special Areas of Conservation (SACs), which are firstly identified by respective Member States and then approved by the Commission along with the European Environmental Agency, scientific experts, and the Member States.

Natura 2000 which was founded in 1992 along with the Habitats Directive represents globally the largest network of protected areas providing a safe space for threatened species, particularly breeding and resting sites, and preservation of valuable habitats across all 27 EU countries (Directorate-General for Environment (European Commission) et al., 2008). It focuses primarily on species and habitats listed in the Bird Directive and the Habitat Directive. This coordinated network covers over 18% of the EU's land and 8% of its marine area. Member States are required that all Natura 2000 sites are managed the following way: any activities that could potentially disturb the threatened species or damage the habitats must be avoided; and also appropriate conservation measures must be taken to ensure the preservation and restoration of present species and their respective habitats while accounting for the economic, social, and cultural characteristics of the area (Directorate-General for Environment (European Commission) et al., 2008). More detail on other biodiversity policies implemented by the EU is provided in the table below.

Table 9: List of EU biodiversity policies, their objectives and measures

EU Biodiversity Policies	Objective/aim	Measures
The Birds Directive[3] *(Directive 79/409/EEC)*	EU measures to protect Europe's wild bird species	• Protecting all wild bird species, including their eggs and nests; avoiding deliberate capture or killing in the wild, disturbances, keeping, transport and sale of specimens taken from the wild • Protecting and restoring birds habitats
The Habitats Directive (Council Directive 92/43/EEC)	EU measures to conserve Europe's wild flora and fauna	Member States must prohibit: • all forms of deliberate capture or killing in the wild • deliberate disturbance, e.g. during breeding, rearing, hibernation and migration • deterioration or destruction of breeding sites or resting places, nests or eggs, or the picking, collecting, cutting, uprooting or destruction of protected plants in the wild, and • the keeping, transport and sale of specimens taken from the wild
Natura 2000	The largest coordinated network of protected areas in the world ensuring the long-term survival of Europe's most valuable and threatened species and habitats, listed under both the Birds Directive and the Habitats Directive (SPAs and SACs)	Member States must ensure that in all Natura 2000 sites: • damaging activities are avoided that could significantly disturb the species or deteriorate the habitats for which the site is designated; and • positive conservation measures are taken, where necessary, to maintain and restore the species present and their habitats, taking account of the economic, social and cultural requirements and regional and local characteristics of the area concerned.
The Invasive Alien Species Regulation[4] *(Regulation (EU) 1143/2014)*	Preventing and minimizing the effects on invasive alien species on Europe's biodiversity	The core of the Regulation is the list of Invasive Alien Species of Union concern (Union List). The species included on this list are subject to restrictions and measures set out in the Regulation.

[3] Directive – a type of legislation that includes a shared goal within the EU but it is up to each Member State what laws and tools they'll implement (government-level policy)
[4] Regulation – a binding legislative act that applies to all EU countries (EU-level policy)

		These include restrictions on keeping, importing, selling, breeding, growing and releasing into the environment.
EU Pollinators Initiative[5]	Contributing to global conservation efforts and addressing the decline of wild pollinators	EU actions on pollinators (the EU Pollinators Initiative) aim to • improve knowledge of pollinator decline, its causes and consequences • improve pollinator conservation and tackle the causes of pollinator their decline • mobilise society and promote strategic planning and cooperation at all levels
Urban Nature Platform[6]	Supporting towns and cities in restoring nature and biodiversity	As part of the Biodiversity Strategy, this plan stresses the importance of the collaborative process of developing an urban nature plan, including the need for working with citizens and other stakeholders, and for cross-departmental working and integration of the greening plan with other aspects of urban development, from mobility and health, air and water, to energy and climate adaptation.
The Zoos Directive (Directive 1999/22/EC)	Promoting the protection and conservation of wild animals outside their natural habitat	This Directive calls on Member States to adopt measures for the licensing and inspection of zoos to ensure they respect certain conservation measures.
The EU Green Infrastructure Strategy[7]	Promoting the use and integration of green infrastructure in all EU polices	The EU Green Infrastructure Strategy aims to preserve, restore and enhance green infrastructure to help stop the loss of biodiversity and enable ecosystems to deliver their services to people. The EU Biodiversity Strategy for 2030 promotes investments in green and blue infrastructure, as well as the systematic integration of healthy ecosystems, green infrastructure and nature-based solutions into urban planning.

[5] Initiative – organized by Member States/stakeholders/general public to express a need for an integrated approach (usually a law) across the EU related to a specific issue (government/stakeholder-level policy)
[6] Platform – a project providing guidance and knowledge to relevant stakeholders (e.g., local authorities)
[7] Strategy – a set of political priorities including a plan for how to achieve them (EU-level policy)

Note: Source European Commission (2023d)

Summary

Table 10: Summary table of biodiversity policies including their climate and biodiversity synergies potential.

Policy	**Climate & biodiversity synergies**
EU Biodiversity Strategy for 2030	✓
Birds Directive	biodiversity only
Habitats Directive	✓
Natura 2000	✓
The Invasive Alien Species Regulation	biodiversity only
EU Pollinators Initiative	biodiversity only
Urban Nature Platform	✓
The Zoos Directive	biodiversity only
The EU Green Infrastructure Strategy	biodiversity only

- The **EU Biodiversity Strategy for 2030** currently represents the cornerstone of biodiversity protection, specifically aiming to protect and restore nature, enable transformative change, and support biodiversity globally. The Strategy strives to achieve that by launching a nature restoration plan to restore degraded ecosystems, expanding on the existing Natura 2000 network of protected areas, and improving current finance and investment systems as well as establishing a biodiversity governance framework.
- As for specific biodiversity policies, the two oldest ones are the Birds and Habitats Directives. The **Birds Directive** ensures the protection of all wild bird species across EU while also protecting and restoring their natural habitats. Besides that, Member States are also required to classify Special Protected Areas for 197 species of wild birds. Similarly, the **Habitats Directive** includes a list of species that need to be strictly protected across EU along with their habitats and each EU country is required to identify and classify Special Areas of Conservation.
- **Natura 2000** represents globally the largest network of protected areas providing a safe space for threatened species, specifically for those listed in the Birds and Habitats Directives (SPAs and SACs). The network covers over 18% of the EU's land and 8% of its marine area. Member States are required to protect these areas and prevent any damage or disturbance.
- Other specific policies aiming to protect biodiversity in all its forms across EU include: The Invasive Alien Species Regulation, EU Pollinators Initiative, Urban Nature Platform, The Zoos Directive, and The EU Green Infrastructure Strategy.

2.5.3 EU Land-use and water policies

Land use, in general, has a profound effect on both biodiversity loss and climate change and thus policies that regulate land use are indispensable in the fight against these environmental crises. In the section below we briefly discuss some of the major EU policies that are relevant for land use – and thus for both conserving biodiversity and for addressing climate change mitigation and adaptation linked to land use, in other words, have synergistic ambitions.

Common Agricultural Policy (CAP)

With over 10 million farms across the European Union employing around 22 million people, agriculture represents a crucial sector in this regard (European Commission, 2023f). One of the oldest land-based policy established at the European Union level is the CAP, dating back to 1962 (European Commission, 2023f)Its primary purpose, to jump-start food production after World War II, has gradually shifted to being more nature—and sustainability-focused.

The latest CAP legislation framework concerning the period from 2023 to 2027, entered into force on January 1st 2023 and is claimed to be the most climate and biodiversity-friendly a socially just reform to date (European Commission, 2023e). Out of ten CAP's main objectives, three relate to the environment, specifically enhancing climate change action, biodiversity protection, and sustainable management of natural resources, which align with the goals of the European Green Deal, Farm to Fork Strategy and Biodiversity Strategy (European Commission, 2023e).

To make the CAP reform compatible with the European Green Deal and support the above-mentioned environmental objectives, the European Commission included new tools, such as 'eco-schemes', which aim to promote sustainable farming by rewarding farmers who voluntarily apply additional sustainable practices (e.g., agroforestry and organic farming), as well as a new system of conditionality for CAP payments receivers, requiring Member States to adhere to new obligations, such as the protection of wetlands and peatlands from 2025 or taking new directives (e.g., Directive on the Sustainable Use of Pesticides) into consideration, while providing a significant flexibility according to nations' circumstances (European Commission, 2020c). Furthermore, countries' flexibility is also supported by the implementation of CAP Strategic Plans, which allows Member States to implement CAP obligations according to their countries' environmental needs and circumstances.

The new CAP reform also considers the management and health of the most essential agricultural source – the soil. However, due to farmers' protests and agricultural lobby across the EU in the past months, a Regulation amending CAP Strategic Plans Regulation and CAP Horizontal Regulation was announced on the 15th of March 2024 (European Parliament, 2024c). This means that, if adopted, some of the original requirements and obligations will no longer be in place or will be simplified. For example, farmers will not be required to dedicate at least 4% of their land to non-productive features to support biodiversity protection (it will be voluntary), which was in the original CAP version (European Parliament, 2024c). Also, crop rotation could be replaced with crop diversification, making it easier for farmers to comply with the CAP standards; Member States will be allowed to change their national CAP strategic plans up to twice a year (instead of once a year); and many other exemptions (European Parliament, 2024c).

Farm to Fork Strategy

The issues of biodiversity loss and climate change are also central to the Farm to Fork Strategy, a significant component of the European Green Deal, which aims to achieve "fair, healthy, and environmentally-friendly food system" (European Commission, 2020a). Its four major pillars relating to food chains are sustainable food production, sustainable food processing and distribution, sustainable food consumption, and food loss and waste prevention leading to a neutral or positive environmental impact, including, among others, climate change mitigation and reversing the loss of biodiversity (European Commission, 2020d). Reflecting on the Covid-19 pandemic in recent years, the Strategy also emphasizes the need for resilience in our food system to ensure food security.

In terms of climate and biodiversity protection, the Farm to Fork Strategy addresses the following action points (European Commission, 2020d) – firstly, it is crucial to reduce overall environmental pollution (soil, water, air) caused by the excessive use of pesticides and nutrients in agriculture, particularly by reducing:

- the use and risk of chemical pesticides by 50% by 2030;
- the use of more hazardous pesticides by 50% by 2030;
- nutrient losses by at least 50%, while ensuring no deterioration on soil fertility;
- fertilizer use by at least 20% by 2030.

Secondly, the Commission set out to support and promote further the development of organic farming across the EU. It aims to reach 25% of total agricultural land under organic farming by 2030 (European Commission, 2020d).

Besides the above-mentioned regulations concerning the sustainability transition of EU food production, a significant attention is also dedicated to the food consumption and waste prevention. To reach sustainable food system, consumers must be able to choose healthy and environmentally-friendly diets. The Commission plans to achieve this by developing a sustainable food labelling framework, which will allow consumers to make informed decisions about the nutritional and environmental impact of food products (European Commission, 2020d). Another goal drawn up in the Strategy refers to halving food waste per capita by 2030, which will be reached by proposing legally binding targets at the level of EU Member States.

The Farm to Fark Strategy was published in May 20th 2020 and it is expected that the proposal for a legislative framework regarding sustainable food system will be submitted in 2024 (European Parliament, 2024c). Due to the war in Ukraine since 2022, there has been a lot of debate around whether this strategy does not threaten food security across EU and currently there are ongoing discussions and strategic dialogues about the future of EU agriculture as a whole (European Parliament, 2024c).

EU Soil Policy

To ensure healthy soils, which are essential for both mitigation of climate change and curbing biodiversity loss, the EU proposed the EU Soil Strategy for 2030 and a Soil Monitoring Law. Although soils represent an non-renewable resource essential for our survival, the state of soils globally is degrading rapidly and, therefore, their restoration is one of the key objectives of the European Green Deal and EU Biodiversity Strategy for 2030 (European Commission, 2023b).

The EU Soil Strategy for 2030 was adopted by the European Commission in November 2021 and besides proposing specific action steps by 2030, it also introduces a broader vision for healthier soils by 2050 (European Commission, 2021c). The key objectives include a restoration of degraded EU soils, their protection and sustainable management, reduction of soil pollution and net land take, and strengthening the resilience of soils globally (European Commission, 2021c).

As for the proposed concrete actions, the Strategy contains the following: a scheme for land owners that allows them a free soil testing, a plan to promote sustainable soil management through the CAP and sharing best practices, restoring peatlands and wetlands in order to mitigate climate change by reducing and limiting their drainage, remediating polluted and contaminated soils as well as restoring degraded soils, establishing a methodology for all Member States to monitor and assess land degradation and desertification, and focusing on increasing efforts in research and soil monitoring (European Commission, 2021c).

To make the goals of the EU Soil Strategy legally binding for all Member States, on 5th of July 2023 the Commission proposed **the Soil Monitoring Law** (European Parliament, 2023b). This

directive specifically defines how healthy soil should look like, provides a methodology for monitoring and assessment of the condition of soil and sets out measures for sustainable soil management and recovery of contaminated soil sites (European Commission. Directorate General for Research and Innovation., 2023). According to this proposed directive, EU Member States would be required to conduct soil health assessments every five years based on regular soil monitoring and subsequently reconsider any changes in adopted measures for contaminated sites (European Commission. Directorate General for Research and Innovation., 2023).

EU Forest Policy

Similarly to soil, forests are also crucial for combating climate change and preserving biodiversity. Specifically, forests serve as a global carbon sink, which absorbs carbon dioxide from the atmosphere and consequently mitigates the effect of the ongoing climate change. Besides that, forests are known for their high biological diversity and thus any forest degradation or deforestation impedes these natural benefits. To improve forest health and halt deforestation, the EU adopted the Regulation on deforestation-free products on the EU market and the EU Forest Strategy for 2030 (European Parliament, 2023a).

Regulation on importing deforestation-free products from outside the EU

Many commodities such as soy, cocoa, coffee or beef are associated with the expansion of agricultural land in regions outside the EU and, thus, deforestation and forest degradation. In order to reduce the European contribution to increasing greenhouse gas emissions and biodiversity loss that result from deforestation practices, the EU adopted the Regulation on deforestation-free products, entering into force on June 29th 2023 (European Commission, 2023a). The Regulation requires Member States to monitor the origin of timber that is placed on the EU market by operators and traders, particularly by checking that the timber neither comes from a deforested area nor it caused any forest degradation (Directorate-General for Environment (European Commission), 2021). This new Regulation on deforestation-free products builds on and subsequently replaces the former EU Timber Regulation which reached considerable improvement in illegal logging in third countries as shown in the evaluation in 2021 (European Commission, 2021a).

EU Forest Strategy for 2030

The objectives of the new EU Forest Strategy for 2030, published on July 14th 2021, include particularly reducing greenhouse gas emissions and helping out with the biodiversity goals set out by the EU and thus represents an integral part of both the European Green Deal and the EU biodiversity strategy for 2030 (European Commission, 2023h). To achieve these objectives, firstly, the health and quantity of European forests must be ensured, while also improving their protection and strengthening their resilience.

Therefore, the strategy proposes specific steps and actions to promote socio-economic functions of forest ecosystems and their restoration by: promoting the role of bioeconomy, specifically by supporting sustainable forest bioeconomy for long-lived wood products as well as non-wood forest-based bioeconomy (e.g., ecotourism), while educating and encouraging people to pursue sustainable forest-based bioeconomy; ensuring a strict protection of European primary and old-growth forests and the reforestation and afforestation of forests with high biodiversity potential; strengthening sustainable forest management that will promote forest resilience and climate adaptation; providing financial support for forests owners for improving the state of forest ecosystems across Europe (European Commission, 2021b).

EU Water Policy

Biodiversity protection and land-use is also tightly linked to the management of water resources and ecosystems, both freshwater and marine. With its water policy, the EU aims to

protect and restore all water bodies allowing access to good quality drinking and bathing water for all EU citizens, which includes ensuring a reduction of water pollution and long-term sustainable management of surface water bodies as well as groundwater (European Commission, 2023g). The two major legal frameworks concerning water management and protection is called the Water Framework Directive (WFD) and the Marine Strategy Framework Directive (MSFD), including many specific supporting water directives.

Water Framework Directive

The general objective of the Water Framework Directive (WFD) is to improve the environmental status for freshwater ecosystems and protect inland surface waters, transitional waters, coastal waters as well as groundwater across the EU, which entails reducing pollution caused by agriculture, industry, transport, etc., mitigating the impacts of floods and droughts, protecting water ecosystems, and shifting towards sustainable water use (Kurrer & Lipcaneanu, 2023). As mentioned above, the WFD is supported by specific directives, such as the following: the Groundwater Directive, the Drinking Water Directive, the Bathing Water Directive, the Nitrates Directive, the Urban Waste Water Treatment Directive, the Environmental Quality Standards Directive, and the Floods Directive (Kurrer & Lipcaneanu, 2023).

All directives are biodiversity relevant, particularly in terms of fighting against pollution and excessive levels of nutrients present in water ecosystems, which represent one of the greatest threats to aquatic biodiversity, as also highlighted by the Aichi Biodiversity Target no. 8 (CBD, 2023). For example, the Environmental Quality Standards Directive includes a list of harmful substances and pollutants (e.g., pesticides and pharmaceuticals) and their concentration limits that cannot be crossed in surface waters, while the Nitrates Directive demands that Member States monitor fertilization pollution caused by agricultural practices and are required to prevent eutrophication in water ecosystems (Kurrer & Lipcaneanu, 2023).

Marine Strategy Framework Directive

The protection of marine ecosystems and improvement of their environmental status in the EU is ensured by the Marine Strategy Framework Directive (MSFD). At the moment, it is also complemented by the new EU biodiversity strategy for 2030, which aims to expand protected marine areas and creating strictly protected areas for habitats and fish stocks recovery (European Commission, Directorate General for Environment, 2021; Kurrer & Lipcaneanu, 2023). Furthermore, in 2002, the EU established European Maritime Safety Agency to monitor and prevent marine pollution caused by ships and oil and gas installations, while the Ship-Source Pollution Directive ensures that polluters are held responsible and punished accordingly (Kurrer & Lipcaneanu, 2023).

Summary

Table 11: Summary table of land-use and water policies including their climate and biodiversity synergies potential

Policy	Climate & biodiversity synergies
Common Agricultural Policy	✓
Farm to Fork Strategy	✓
EU Soil Strategy for 2030	✓
Soil Monitoring Law	✓
Regulation on deforestation-free products	✓
EU Forest Strategy for 2030	✓
Water Framework Directive	biodiversity only
Marine Strategy Framework Directive	biodiversity only

- Land-based, land-use, and water policies significantly affect biodiversity loss and climate change and are crucial tools in combating these crises, particularly by sharing the same goals as the overarching European Green Deal.
- **Common Agricultural Policy (CAP)** is one of the most essential land-based policies and with the new CAP 2023-2027 framework aims to incorporate more environmental and socially just objectives, specifically focused on climate change mitigation, biodiversity loss reduction, and fair rewards for farmers, while providing substantial flexibility to the Member States in terms of obligation implementation.
- **Farm to Fork Strategy** aims to achieve fair, healthy, and environmentally-friendly food system by ensuring that all stages of food chains (production, distribution, consumption as well as food waste prevention) more sustainable with positive climate and biodiversity impacts, particularly by reducing the use of chemical pesticides and fertilizers and increasing the overall share of organic farming up to 25% across the EU by 2030.
- Improving soil health is the goal of the **EU Soil Strategy for 2030**, where specific actions are assessed along with a broader vision of healthy soils by 2050. The key objectives of the strategy are mainly focused on restoring degraded soils, their sustainable management and strengthening their resilience. To make these targets enforceable, a **Soil Monitoring Law** was proposed by the Commission.
- Forests, a crucial carbon sink and biodiversity rich habitat, are protected by the **Regulation on deforestation-free products** and the **EU Forest Strategy for 2030**. To prevent any contribution to deforestation or forest degradation, the Regulation requires Member States to monitor the origin of timber on the EU market and intervene if any case of illegal logging is found. The Strategy considers the overall health, protection and strengthening the resilience of EU forests, especially by promoting sustainable forest management and supporting re- and afforestation practices.
- The protection of EU surface freshwater and groundwater resources and their sustainable use is ensured by the **Water Framework Directive**, which attempts to fight against water pollution and eutrophication, significant threats to aquatic biodiversity. Similarly, the **Marine Strategy Framework Directive** strives to protect and improve the quality of marine ecosystems, for instance, by expanding protected marine areas.

3 Enabling reflexive operationalisation of the SJOS

The SJOS concept was defined originally as a global framework. To help in guiding the navigation of transformative pathways, the SJOS concept thus needs to be translated it to make it practicable for diverse social-ecological contexts (Keppner et al., 2020).

Though the original SJOS concept represents scientific evidence-based safeguards, the determination of where to set them and how to translate them to various social-ecological contexts is a highly normative and political process, based on subjective perceptions of risk and justice (Kim & Kotzé, 2021; Raworth, 2012; Turner & Wills, 2022). Making the difficult decisions for defining and achieving the SJOS thus requires flexibility and responsiveness through a reflexive approach (Turner & Wills, 2022). It is therefore important for the operationalisation of the SJOS to be developed iteratively over time, through transdisciplinary and participatory collaboration between actors across science, policy, and practice (Cole et al., 2014), to negotiate targets, roles, rights, and responsibilities, and ensure the capturing of

the plural understandings of a safe and just space (Cole et al., 2014; Jabot, 2023; Keppner et al., 2020; Kim & Kotzé, 2021).

There are many ways that the SJOS could be interpreted for guiding the co-design of transformative pathways. The following sections aim to provide guidance for two different approaches to operationalising the SJOS: (i) as a tool for quantitatively assessing the robustness of transformative pathways through relevant climate, biodiversity, and human rights safeguards; and (ii) as a more normative and qualitative heuristic for guiding transformative pathways, in terms of an opportunity space for positive future visions for climate, biodiversity, and human rights.

3.1 SJOS as pathways assessment tool

3.1.1 Guidance from science

Social-ecological challenges are intrinsically scale-dependent, and most decision making and regulation, for example on natural resources and emissions, takes place at the level of governments, businesses, and individuals, and not on the planetary level; therefore, it may be useful to determine the fair share of the SJOS and associated responsibilities among various actors at the sub-global level (Cole et al., 2014; Dearing et al., 2014; Häyhä et al., 2016; Kim & Kotzé, 2021). Defining context-based SJOSs could start from the global SJOS framework and downscale the planetary boundaries and social foundation to determine the assigned share of the SJOS for the desired scale, using relevant indicators and ethical allocation principles.

The social foundation of the SJOS measures the wellbeing of a population, and it can be scaled to any level (Cole et al., 2014) depending on data availability. The climate change boundary has remained steadfast as originally defined, as an atmospheric CO_2 concentration of 350 ppm, and as a 'truly global' boundary, every emission reduction counts equally, regardless of the origin place (Nykvist et al., 2013). Emissions data for various sub-global scales are often readily available, and these factors make climate change one of the more robust boundaries to define and downscale from a top-down approach (Nykvist et al., 2013). In contrast, the complexity of the boundary of biosphere integrity (formally biodiversity loss) has made it challenging to define and quantify at the global scale, making it one of the main points of critique towards the planetary boundaries framework (Mace et al., 2009; Montoya et al., 2018; Rockström et al., 2009; Steffen et al., 2015). However, the significant geographical heterogeneity of biosphere integrity points towards the local level perhaps being a more suitable scale for quantifying this complex boundary (Chen et al., 2021). Lessons drawn from diverse sub-global SJOSs could then help to iteratively feed back into the global SJOS framework, particularly for the biodiversity boundary (Chen et al., 2021; Dearing et al., 2014; Hoff et al., 2014).

Downscaling the planetary and social boundaries of the SJOS can either be done using a top-down, bottom-up, or hybrid method (Xue & Bakshi, 2022). The top-down approach method defining the boundary thresholds at the global scale, usually directly from the original planetary boundaries and doughnut framework, and then downscaling it to the desired level (Häyhä et al., 2016; Xue & Bakshi, 2022), which is well-suited to the inherently global climate change boundary, but challenging for the biosphere integrity boundary which currently lacks consensus on a global boundary. In contrast, the bottom-up method involves defining sub-global boundary thresholds using relevant tailored databases for example at the regional scale, which can then be further downscaled to local scales (Xue & Bakshi, 2022). This bottom-up method may be more suitable for defining the biosphere integrity boundary and social boundaries, as highly context-dependent. It is also possible to adopt a hybrid method, by defining harmonised boundary thresholds at sub-global scales which connect both local and global information, thus simultaneously safeguarding both global and sub-global SJOSs,

which can then be downscaled to local scales (Xue & Bakshi, 2022). Table 12 presents a summary of existing approaches to downscale the global SJOS to various scales.

Table 12: Summary of existing approaches to downscaling the SJOS.

Scale	Approach	Key points	Reference
Flexible	Top-down	Relevant planetary boundaries (PBs) first selected, then downscaled to the individual level using ethical allocation principles. The resulting individual share is then upscaled to the desired level (e.g., product, service, company, organisation, or nation). Results in an 'actual sustainability ratio' (gap between stakeholders' actual impact on the PBs and their assigned share of the safe operating space. This is then used to provide, categorise, and score action recommendations.	Hjalsted et al. (2021)
European	Hybrid (climate change: top-down; biodiversity loss: bottom-up)	Downscaled PBs by quantifying the impact of European consumption patterns to determine environmental boundaries of sustainable resource use or emissions within Europe. European per capita footprints then compared with equal allocation across the global population. Highlight that interactions and feedbacks among the planetary boundaries are yet to be explored, but need to be accounted for in European policymaking.	Hoff et al. (2014)
National	Hybrid (climate change: top-down; biodiversity loss: bottom-up)	Climate change PB downscaled by calculating equal per capita territorial and consumptive performance. The link between population, consumption, and biodiversity loss is much more complex, more associated with local-to-regional thresholds than global. Propose 3 alternative indicators: (i) number of threatened species nationally per million capita; (ii) number of threatened species globally, driven by consumption (e.g., international trade); (iii) percentage of protected marine and terrestrial areas.	Nykvist et al. (2013)
	Top-down	Downscaled the SJOS for 150 nations using indicators based on human needs, then used a top-down, equal-per-capita approach to distribute the share of each boundary to countries. Also acknowledged the potential need for a differential responsibilities approach to downscaling.	O'Neill et al. (2014)
	Hybrid	Downscaled the SJOS by maintaining its original design through a decision-based approach to select relevant dimensions, drawing indicators either top-down directly from original SJOS or bottom-up by defining them at the national scale where more appropriate. Resulted in a national 'barometer' for inclusive sustainable development in South Africa.	Cole et al. (2014)
Regional	Bottom-up	Downscaled SJOS to two regions in China. Followed original social foundation using relevant national and sub-national data for indicators. Determined regional biophysical boundaries based on water regulation data from monitoring, survey, remote sensing, and sediment analysis data.	Dearing et al. (2014)
Sector & product	Top-down	Downscaled global PBs to the energy and transport sector in Tonga using an equal-per-capita approach to first downscale the PBs to the national level, then determined Tonga's share of the safe operating space. Then quantified the environmental impacts of the energy and transport sector by combining the PBs with a life-cycle assessment methodology.	Ali & Ryberg (2023)
	Top-down	Downscaled the PBs, through a combined PB framework and life-cycle assessment methodology, to the wood-based bioadhesive market. Used a top-down approach from the global to the continental and/or regional level.	Arias et al. (2022)

	Top-down	Downscaled PBs for the sustainability assessment of washing machines in the United Kingdom, considering the environmental impact, societal value, product efficiency and function, and demand. Made use of the ability to pay sharing principle.	Sherwood (2022)

Ethical allocation principles

An important consideration when downscaling the SJOS to sub-global scales is the fair allocation of the share of the safe and just space, for which a range of allocation or sharing principles have been used, as summarised in Table 9.

Table 13: Summary of principles for allocating shares of the SJOS.

Principle	Description	References
Egalitarian (most commonly applied)	Equality among individuals (equal per capita sharing of the SJOS)	Arias et al. (2022); Gebara & Laurent (2023); Häyhä et al. (2016); Hjalstad et al. (2021); O'Neill et al. (2018); Ryberg et al. (2020)
Utilitarian	Maximisation of utility (welfare) in society (e.g., economic parameters: gross value added and final consumption expenditure)	Arias et al. (2022); Gebara & Laurent (2023); Ryberg et al. (2020)
Prioritisation	Higher weight given to subgroup, based on specific criterion (e.g., level of income (ability to pay) or impact/responsibility (polluter pays)	Gebara & Laurent (2023); Häyhä et al. (2016); Hjalstad et al. (2021); Sherwood (2022);
Acquired rights / grandfathering	Allocated share is proportional to the current share of environmental impacts	Arias et al. (2022); Hjalstad et al. (2021); O'Neill et al. (2018); Ryberg et al. (2020)

The limits of limits

Though there have been many attempts to downscale the SJOS, downscaling faces many challenges when faced with complex social-ecological systems, the need to maintain goal coherence across scales, and to navigate power dynamics, inequalities, and trade-offs (Turner & Wills, 2022). Moreover, a strictly quantitative downscaling approach, leading to a more static snapshot of limits to remain within, may not necessarily inspire the positive and creative thinking for developing transformative pathways towards a desirable future. For instance, taking the planetary boundaries as static may neglect the possibilities for regenerative pathways that may even push these boundaries outwards (Dryzek, 2016; WP1 Glossary, 2023).

3.2 SJOS as boundary object

3.2.1 Guidance from science and practice

Pathways represent combinations of actions spanning short, medium, and long time frames, comprising positive leverage or tipping points across multiple temporal, spatial, and social scales that can synergise and cascade into a system transformation. This thinking and acting across scales is challenging, and calls for a degree of flexibility and creativity. Operationalising

the SJOS as a boundary object, in the form of a more qualitative, normative heuristic or opportunity space for action, may provide useful guidance for this.

TRANSPATH aims to explore transformative pathways away from current locked-in systems of over-production and consumption, towards more regenerative and distributive systems, for which the concept of a SJOS can provide a powerful vision. Though the SJOS is originally fundamentally about limits within which to operate, its key message, of a world in which the Earth's resources are shared fairly among all while safeguarding the health of the planet, can spark positive visions of a safe and just future.

For example, Hölscher et al. (2022) adopted the SJOS framework in their transformative visioning activities, concluding that the SJOS provided useful and holistic guiding principles for visioning, and helped stakeholders to consider multiple sectors and topics they had not thought about before, as well as the opportunity to see how their ideas interconnected ad contributed to a bigger picture. In addition, Hölscher et al. (2022) found that the SJOS helped to navigate the complexity and immensity of sustainability challenges, and stimulate reflexivity for moving beyond archetypal, generic future narratives.

As pointed out by Hebinck et al. (2018), foresight processes such as visioning can only be a starting point for transformative change, and transformative action needs to follow. For the SJOS to be engaged effectively as a boundary object, it must also help to open up consideration of the diversity of possible safe and just pathways (Leach, 2015).

Qualitative guidance for putting the SJOS framework into action in various contexts could be drawn from the Doughnut Economics Action Lab (DEAL), founded in 2019 by Carlota Sanz and Kate Raworth, as an open community working on turning Doughnut Economics (SJOS) from a radical idea into transformative action aiming to bring about systemic change (Doughnut Economics Action Lab, n.d.). The community represents changemakers including across communities, education, various geographical contexts, business, and government, and shares principles, guidelines, tools, and stories. For example, DEAL has proposed the following 'Doughnut Principles of Practice' for any project and initiative aiming to put Doughnut Economics (SJOS) into practice (Doughnut Economics Action Lab, 2020):

Table 14: Doughnut Principles of Practice.

Principle	Description
Embrace the 21st century goal	Aim to meet the needs of all people within the means of the planet, and aim to align your (organisation's) purpose, networks, governance, ownership, and finance with this goal. Expect the work to be challenging, innovative, and transformative.
See the big picture	Recognise the potential roles of the household, commons, market, and state, as well as their many synergies, in the transformation of economies. Ensure that finance serves the work, rather than driving it.
Nurture human nature	Promote diversity, participation, collaboration, and reciprocity. Strengthen community networks and work with a spirit of high trust. Care for the wellbeing of the team.
Think in systems	Experiment, learn, adapt, evolve, and aim for continuous improvement. Be alert to dynamic effects, feedback loops, and tipping points.
Be distributive	Work in the spirit of open design and share the value created with all who co-created it. Be aware of power and seek to redistribute it to improve equity amongst stakeholders.

Be regenerative	Aim to work with and within the cycles of the living world. Be a sharer, repairer, regenerator, steward. Be climate and energy smart.
Aim to thrive rather than to grow	Do not let growth become a goal in itself. Know when to let the work spread out via others, rather than scale up in size.

Note. Adapted from "Doughnut Principles of Practice," Doughnut Economics Action Lab, 2020 (https://doughnuteconomics.org/tools/23). CC BY SA 4.0.

These principles also overlap with the following principles for fostering more transformative governance across the biodiversity-climate-society nexus:

- Focus on multifunctional interventions
- Integrate and innovate across scales
- Create coalitions of support
- Ensure equitable approaches
- Build social tipping points (Pascual et al., 2022).

Putting the global SJOS concept into action in various contexts involves a dialogue between the global and local scales and social and ecological issues. DEAL has also produced an approach to facilitate this, through an unravelled version of the global SJOS doughnut into four lenses, shown in Figure 6.

Figure 4: The four lenses for an unravelled doughnut.

Note. From "Doughnut Unrolled: Introducing the four lenses," Doughnut Economics Action Lab, 2022 (https://doughnuteconomics.org/tools/142). CC BY SA 4.0.

These four lenses can be used as a framework to explore how actions can address both social and ecological issues, and combine local aspirations of a particular context with its global responsibilities (Doughnut Economics Action Lab, 2022).

4 Enabling reflexive deliberation on SJOSs

4.1 Introducing reflexivity

Reflexivity can broadly be defined as “the self-critical capacity of a structure or process or set of ideas to change itself after scrutiny of its own failures (or successes)” (Dryzek, 2016, p. 942). As opposed to the related concept of adaptivity, reflexivity involves the capacity to not only *do* something different, but also to *be* something different (Dryzek, 2016).

To achieve a safe and just future for people and nature in the context of the Anthropocene, action at the level of direct drivers is necessary but insufficient, as urgent transformative changes which target the root causes of the social-ecological challenges, as the underlying drivers including values, structures, practices, paradigms, and regimes, is also needed, for which a reflexive approach is an important part in overcoming unsustainable path dependencies (Díaz et al., 2019; Dryzek, 2016; Huntjens, 2021; Pereira et al., 2015; Scoones et al., 2020; van Bruggen et al., 2019). Moreover, due to the difficulty in defining transformations themselves and their processes, there is a crucial need to work iteratively and reflexively, to consider how knowledge can inform action and the different pathways transformations can take shape through (Scoones et al., 2020). This requires the principles of taking seriously diverse knowledges, plural pathways, and the inherently political nature of transformations, to open up new spaces for innovation, deliberation and contestation, and democratic debate (Scoones et al., 2020).

Collective learning processes are at the heart of a reflexive approach to complex and unpredictable social-ecological systems. Such processes require active involvement of a diversity of stakeholders across science, policy, and practice in a transformative process of ongoing adaptation and evaluation, ultimately leading to the development of policy pathways (Huntjens, 2021; van Bruggen et al., 2019). Informed decisions about possible social and environmental needs, trade-offs and synergies in particular contexts relies on dialogue among diverse knowledge holders and stakeholders (Häyhä et al., 2016). The process of co-designing policy pathways also requires critical reflection on the underlying drivers of the system, as well as commitment to building capacity in the stakeholders involved in the social learning process (van Bruggen et al., 2019). Transformative change requires that researchers also engage in a reflexive process themselves, by recognising the subjectivity they bring to the research and conducting deep reflection on their own values and goals in the knowledge-production process (Crouzat et al., 2018; Olmos-Vega et al., 2022; Pereira et al., 2015). A more open and transparent conducting of research through the transdisciplinary co-design of solutions helps to enable reflexivity, in which the assumptions and hypotheses underpinning the research remain flexible to deliberation and change throughout the research process (Olmos-Vega et al., 2022; Pereira et al., 2015).

5 Enabling deliberation for social-ecological reflexivity

5.1 Social-ecological reflexivity

The concept of ecological reflexivity is presented as a conscious antidote to unsustainable path dependencies, and provides a useful heuristic device (Pickering, 2019) for guiding the deliberative processes undertaken in the TRANSPATH project. Ecological reflexivity is defined as follows:

"the capacity of an entity (e.g. an agent, structure, or process) to: recognise its impacts on social-ecological systems and vice versa; rethink its core values and practices in this light; and respond accordingly by transforming its values and practices" (Pickering, 2019, p. 1150), as shown in Figure 5. Considering this definition encompasses the social-ecological dimension we refer to social-ecological reflexivity in this report.

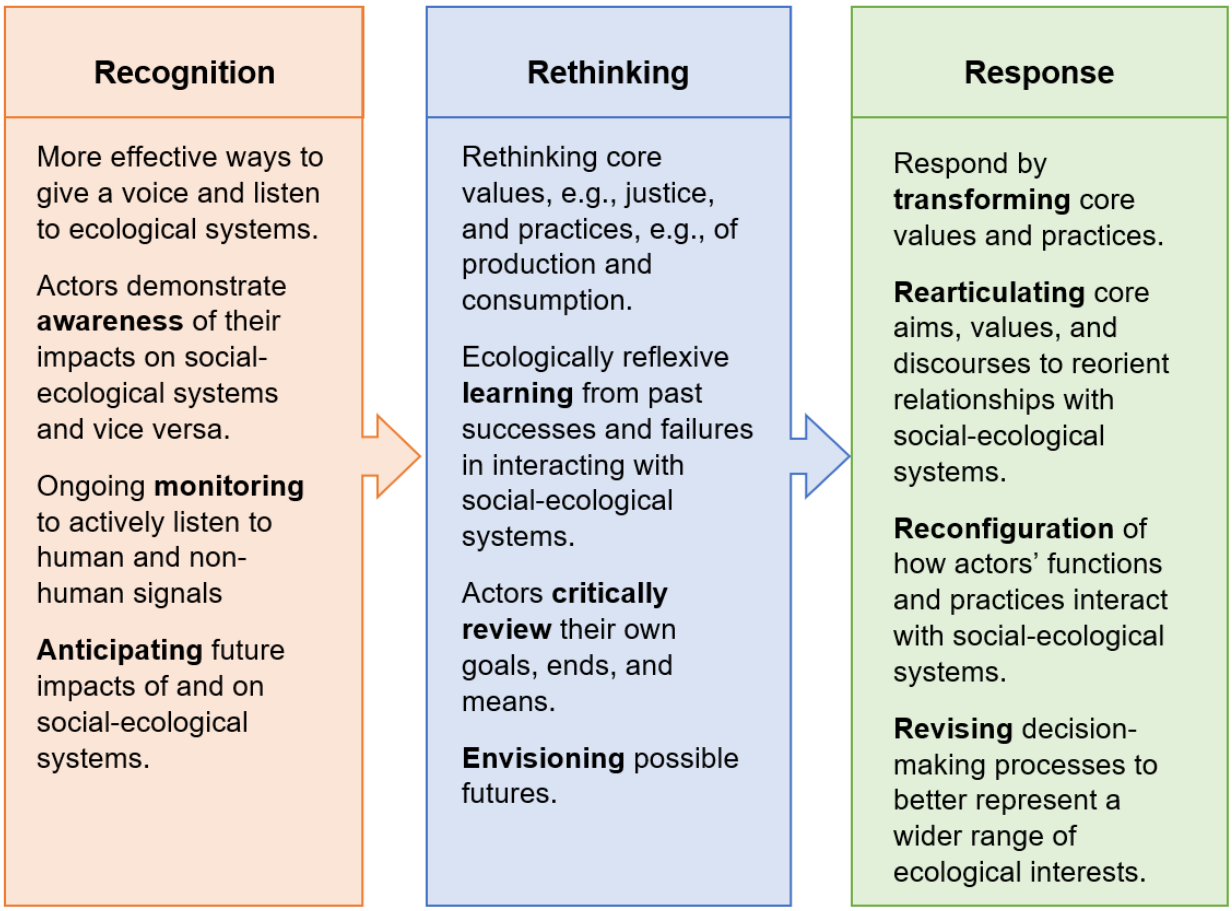

Figure 5: Processes of social-ecological reflexivity.

Note. Based on Dryzek (2016) and Pickering (2019).

5.1.1 Introducing deliberation

To put socio-ecological reflexivity into practice, deliberation can serve as a catalyst, or key point of leverage, working to overcome damaging path dependencies through the processes of listening, learning, and anticipation (Dryzek, 2016; Dryzek & Pickering, 2017). Deliberation can be defined as dialogue which is "aimed at producing reasonable, well-informed opinions in which participants are willing to revise preferences in light of discussion, new information, and claims made by fellow participants" (Chambers, 2003:309, as cited in Dryzek & Pickering, 2017).

In the context of transformative change towards more sustainable consumption and production systems, deliberation, for example in the valuation of environmental services in diverse contexts, has been shown to help transform preferences towards more long-term, intrinsic values of nature (Dryzek & Pickering, 2017). In practice, deliberative exercises need to take context into account, including cultural variations in values of nature and processes of collective decision making on environmental concerns (Dryzek & Pickering, 2017).

5.1.2 Tools for enabling social-ecologically reflexive deliberation

TRANSPATH involves both inter- and transdisciplinary knowledge production across a diverse group of researchers and stakeholders. Reflexive deliberation plays an important part in the project's processes to co-design transformative pathways to a safe and just operating space, in terms of collectively questioning not only the underlying drivers of over consumption and production, but also the discipline-based knowledges in the inter- and transdisciplinary knowledge production processes (Dryzek & Pickering, 2017). This section aims to provide tools to enable reflexive and inclusive deliberation on transformative pathways in the context of safe and just operating spaces for climate, biodiversity, and human rights and individual and collective responsibility, thus facilitating reflection on SJOSs among researchers and stakeholders with diverse perspectives.

Recognition

For the dimension of recognition in this project, an important question arises, of how to communicate the science of the SJOS to diverse stakeholders so that they can recognise, in their contexts, what their role and impact is in the relevant social-ecological system, and vice versa. Currently, we are faced with a potentially broken science-society contract (Turnhout & Lahsen, 2022), as after several decades of considerable growth in knowledge on climate change and biodiversity loss, progress towards solving them has been meagre (Ansari et al., 2022). Often, significant communicative gaps between researchers, practitioners, and local communities prevent success in this regard (Ansari et al., 2022). To communicate the concept of SJOS to diverse stakeholders, overly techno-specific representations of quantifiable causes and effects should be avoided, to prevent psychic numbing and instead better align to local perspectives on climate change and biodiversity loss (Ansari et al., 2022; Hartman & Oppermann, 2020).

A useful starting point for enabling better science communication is that of boundary work, particularly boundary objects, as which the SJOS could be operationalised. The SJOS for social-ecological systems could be seen as a powerful bridging concept, by integrating biophysical Earth system tipping points with social considerations of distributional equity and justice (Oliver et al., 2022).

Table 14. Boundary objects

Tool: concept	Boundary objects
	Boundary objects refer to ambiguous artefacts like things, concepts, discourses, and processes with interpretive flexibility, while serving as a solid nexus for deliberation among diverse worldviews The SJOS could be used as a boundary object for enabling deliberation among diverse stakeholders, by: • Guiding recognition of the current state and pathways in terms of the biophysical boundaries for climate change and biodiversity, and social foundation for the relevant context • Deconstructing and translating the SJOS limits into an opportunity space to inspire positive, forward thinking on pathways into the SJOS •

Note. Based on Franco-Torres et al. (2020).

Rethinking

Enabling the rethinking of core values and practices in light of the complex challenges of climate change and biodiversity loss requires going beyond simply applying the science,

towards greater engagement of diverse stakeholders in knowledge co-design and generation processes that bridge across scales (Häyhä et al., 2016). As researchers, this may involve a transformation in roles away from solely knowledge production, towards facilitation, brokering, convening, and steering collaboration and exchange, for example in 'transformation labs' (Scoones et al, 2020).

Table 15. Transformation labs

Tool: method	**Transformation labs (T-labs)**
	• Transdisciplinary spaces for deliberative dialogue on transformations towards sustainability in social-ecological systems • Mobilise people and action around a complex sustainability challenge • Can use theoretical anchors to provide common language and approach, such as the SJOS framework • Give opportunities for learning and reflexivity in exploring diverse values and interests • Space for confronting and discussing assumptions about which transformative pathways will be most successful, for whom, and why • Particular structure and process differs depending on the geographical context • Should be informed by the needs of the participants, including in the design phase • Should also reflect on the process itself, and remain flexible to adapt to issues raised • Ongoing engagement processes rather than one-off events • Justification of the T-lab design, convening, and participant selection should be transparent to ensure legitimacy
	Process There is no exact prescribed method for conducting methods like T-labs, as this is dependent on the particular context, and should be co-designed with the relevant stakeholders. However, a general approach could involve: • Problem structuring and goal envisioning, in which the participants deliberate on and develop a shared vision for a future safe and just opportunity space for climate, biodiversity, and human rights, for example using scenario-building techniques • Co-designing transformative pathways in concrete contexts towards these futures using back-casting techniques, to identify and articulate how integrated solutions may develop over time • Enabling transformative learning throughout, regarding altering thinking, practising, and organising towards new practice sets and paradigms to better align to action and the slow and fast dynamics of social-ecological systems
	Competences and skills for facilitators Enabling and facilitating these transformative spaces also requires a range of competences and skills, including: • The ability to design a collaborative journey • Competence in facilitating large groups and related methods, initiating and moderating dialogue, and managing or leveraging conflict • Recognition that pathways are not apolitical, and recognising and managing power relations • Expertise in identifying and attracting relevant stakeholders

	• Competence in systems-thinking • Capacity for co-generation, e.g., through appreciative inquiry • Methods for futuring and skills for transformative scenario planning • Developing long-term relationships, e.g., community/network-building

Note. Based on Ely (2021); Muff (2016); Pereira et al. (2015); Pereira et al. (2020); Scoones et al. (2020); Smith and Stirling (2010); and Tàbara et al. (2018).

Transformative change requires identifying and targeting underlying system drivers, including paradigms and values that underpin the design, rules, and practices of the system, for which the concept of inner transformations to sustainability could serve as a useful guidepost for activities around rethinking (Woiwode et al. (2021).

Table 16. Inner transformations to sustainability

Tool: concept	**Inner transformations to sustainability**
	Based on leverage points: • Shallow: material aspects of systems, e.g., incentives and resource flows, and the feedback loops between them • Deeper: structuring elements of systems, their rules and institutions • Even deeper: design, intents, and paradigms underpinning systems
	Inner transformations to sustainability relate to the deeper leverage points, fosters new avenues for change through reflection and dialogue, and relate to different scales from the individual, to the collective, to the systems level Inner transformations–sustainability nexus includes: • Subjective well-being and physical health • Self-reflection and awareness • Activation of (intrinsic/non-materialistic) core values • Pro-environmental and pro-social attitudes (e.g., consumption choices and social activism) • Deliberate, flexible, and adaptive attitudes • Sense of inter-connectedness, compassion, equity, and social justice • Human–nature connectedness • Sustainability-oriented social learning and innovation (including integration of different ways of knowing)

Note. Based on Woiwode et al. (2021).

As the toolkit further develops, various sets of concrete support for operationalising socio-ecological reflexivity among researchers and stakeholders will be produced. A very tentative example is provided in box 1 where a number of questions are listed for each of the three elements of socio-ecological reflexivity; recognize, rethink and respond. The questions can be used both to guide the researcher on what kind of information needs to be identified to operationalise reflexivity – but they can also (in some appropriate sub-selection) be used in interactive settings with stakeholders individually or collectively. For some questions tentative ideas of promptings for answers are provided within []. This gives directions for what kind of information packages could be prepared for access by stakeholders.

Table 17. Possible questions for deliberation with/among stakeholders aligning with the three elements of socio-ecological reflexivity.

Recognize	
Climate change	**Biodiversity**
What are humans doing to the climate system on our planet? [provide accessible facts from IPCC reports for the global scale and more regional/national/local for other scales if relevant] **How is this affecting the web of life and humanity?** **[provide accessible facts from IPCC reports for the global scale and more regional/national/local for other scales if relevant]** **Which human activities are damaging the climate system most?** **What am I doing that contributes to climate change?** **[**providing relevant facts linked to stakeholder's activity/sector – for individuals link to carbon footprint calculators etc.] **How much do I contribute compared to my neighbours, people in other countries?** [provide accessible comparisons of diversity in emissions per capita/per sector etc.]	**What are humans doing to the web of life, biodiversity on our planet and how is this affecting humanity?** [provide accessible facts from IPBES reports for the global scale and more regional/national/local for other scales if relevant] **Which human activities are damaging biodiversity most?** [provide accessible facts from IPBES reports for the global scale and more regional/national/local for other scales if relevant] **What am I doing that contributes to the loss of biodiversity?** [providing relevant facts linked to stakeholder's activity/sector – for individuals link to carbon footprint calculators etc.] **How much do I contribute compared to my neighbours, people in other countries?** [provide accessible comparisons of diversity in emissions per capita/per sector etc.]
Rethink	
What do we need to re-think? **Who am I/Who are we?** **What is my relationship to nature?** **What is my relationship to other people?** **Why do I value nature? What is my/our vision for the world of my children and grandchildren?** **What is the vision of today's societies for the future?** [provide alternative value frameworks] **Am I responsible to respond to climate change and biodiversity loss, and then why?** [Giving cues to reasons such as - causing the problem/having capacity to act/caring/Other]	
Respond	
What can I keep doing? **What can I stop doing?** **What can I do differently?** **What can we do together as communities/business/sector etc?** **How can we build our individual and collective capacity to recognize, rethink and respond?** **What role can deliberation play in this process?** **Can we transform our societies deep enough and fast enough?**	

Response

Responding in light of the lessons learned in the recognition and rethinking processes is an important step in socio-ecological reflexivity, in terms of transforming values and practices (Pickering, 2019) and thus targeting deep leverage points in the social-ecological system at

hand. A core aim for TRANSPATH is to co-design transformative pathways for synergising just biodiversity and climate actions.

Table 18. Three Horizons approach

Tool: method	**Three Horizons approach**
	Provides a context in which people can legitimately share different perspectives both amongst each other and internally Based on visioning short-, medium-, and long-term futures as more significant than only measures of time **Horizon 1** • Business as usual pathway (current, locked-in production and consumption systems) **Horizon 3** • Emerged as the long-term successor to business as usual pathway, through transformative shifts **Horizon 2** • Pattern of transition activities and innovations looking both ways (some adopted by H1 to continue business as usual, some pave the way for the emergence of radically different H3 systems)
	Questions for participants Step 1: Horizon 1 • What evidence do you see around you that suggests the current system is under strain, shows a decreasing fit to the emerging conditions, knowledge, and societal requirements, or is even failing? Step 2: Horizon 3 • What visions are there for the future system, and what values and norms would support it? • What long term trends are driving towards these changes? Step 3: Horizon 2 • What innovations do you know about that might be growth points of the future system? • Are some obviously H2 minus and some H2 plus?
	Competences and skills for the facilitator • Holding the mental and emotional safe space for people to explore the horizons • Ensure all voices are heard in the visioning process • Practised three horizons thinking and developed their own future consciousness

Note. Based on Sharpe (2019).

There are likely to be many possible transformative pathways in(to) SJOSs for climate, biodiversity, and human rights, aligning with different cultures, visions, and values, and each with different costs, risks, and distributions of power and benefits (Leach et al., 2013). A framework for better understanding and assessing these different pathways at different scales, in terms of compatibility with social justice is the three “D’s” approach, referring to direction, diversity, and distribution (Leach et al., 2013).

Table 19. Three "Ds" approach

Tool: framework	Three "Ds" approach
	1. Which **directions** are different current/potential pathways heading? - Unsafe pathways breaching PBs - Unjust pathways undermining human rights - Alternative safe and just pathways - What would it take to re-steer pathways into the SJOS, and support those steering within it? - This brings attention to the goals, values, interests, behaviours, practices, and power relations driving particular pathways 2. Is there a sufficient **diversity** of approaches? - A wide enough range of pathways being explored and tested to ensure at least one offers a promising way forward in any context and in the face of uncertainties in social-ecological systems - A diversity of possible pathways helps foster respect for and response to the values and needs of diverse people and places 3. What are the implications for **distribution?** - Who stands to gain or lose from the current/potential pathway? (e.g., in terms of resource access, wellbeing, or power) - Who will bear responsibility for associated costs and risks? - Distributional implications form the basis for identifying pathways that promote social justice and enable more equitable sharing of the SJOS

Note. Based on Leach et al. (2013).

5.1.3 Tools for being a reflexive researcher

To connect with transformative change and work towards a better science–society contract, researchers should adopt reflexivity throughout the research process, not only in deliberations with stakeholders, but also with themselves, to self-critically reflect on their own assumptions, presuppositions, the interests served by the research, whose knowledge is excluded, and with what consequences (Feindt & Weiland, 2018; Olmos-Vega et al., 2022; Turnhout & Lahsen, 2022). This also involves acknowledging and embracing the subjectivity researchers bring (Olmos-Vega et al., 2022). Reflexivity for researchers could be personal, through inward reflection; interpersonal, in relationships with the research team and participants; methodological, reflecting on methodological decisions; and contextual, by locating a project in its cultural and historical context (Olmos-Vega et al., 2022). To put this into practice, researchers could construct a reflexivity plan (Olmos-Vega et al., 2022; Walsh, 2003), which could make use of the following tools.

Table 20. Reflexive practices for researches

Tools: methods	Reflexive practices for researchers
	These practices aim to bring intention to processes of reflecting on assumptions, decisions, contexts, and power dynamics **Narrative autobiography** • Reflective writing approach where researchers write freely about their background and motivations • Aim to reflect on how their personal experiences may influence the research • Could serve as an initial entry in **reflexive journalling**

	Self interview • Researchers could interview themselves or be interviewed by other research team members, for example using the questions drafted for participants, to reflect on their assumptions about the topic and compare this to the participants' experiences • Could be conducted throughout the process to see how this evolves **Reader–response exercise** • In data analysis, includes a layer of codes representing how researchers react to and interpret participants' accounts, in relation to their personal background and history **Structured team-reflexive discussion** • Each team member engages in reflective writing to reflect on their own paradigmatic stance, assumptions, experiences, expectations, etc. • Answers are then shared within the team and discussed, to learn about each members' position **Member reflection** • Involves checking in with participants, giving the opportunity to change their perspectives or add new interpretations • Could be done through follow-up interviews and focus groups, or inviting participant collaboration and feedback on raw / interpreted data, thus supporting monitoring and evaluation
	Questions to trigger reflection in leverage points research 1. What is the system of focus and what are its properties (paradigm, design, processes and materials)? 2. What are the problem framings and norms that underpin this system framing? 3. What systems is the focal system nested within or connected to? 4. Which system properties does the intervention target, in which focal system? 5. What properties are impacted over time, or space, or via indirect impacts? 6. How does that intervention influence and work in connected or nested systems? 7. Where am I in the system? 8. What are the boundary objects within this system? 9. How do I act, and what normative framings do I add to this system?
	Decision tree for identifying positionality Transparency on researcher positionality and self-reflexivity on this is important in both qualitative and quantitative research [expand]. From the conceptual framework (D1.1), for reflecting on positionality:

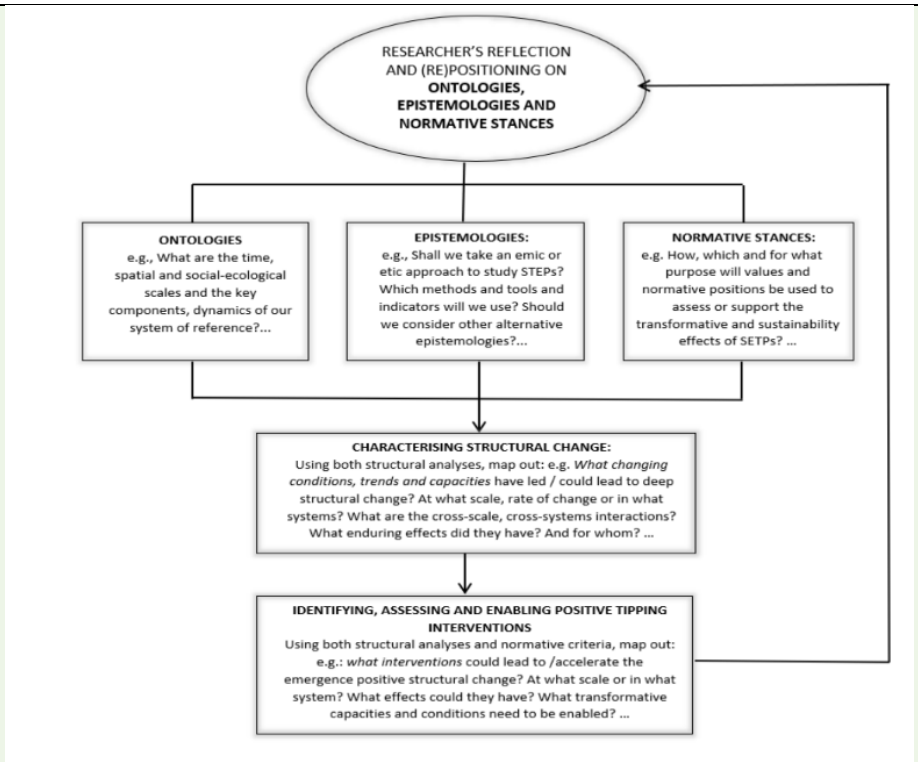

Figure x: Expressing researchers' different positionalities at an early stage can help to mutual and second order learning in the discovery of both leverage and tipping points. (Source: Tabara et al., 2021). Note: from the conceptual framework (D1.1).

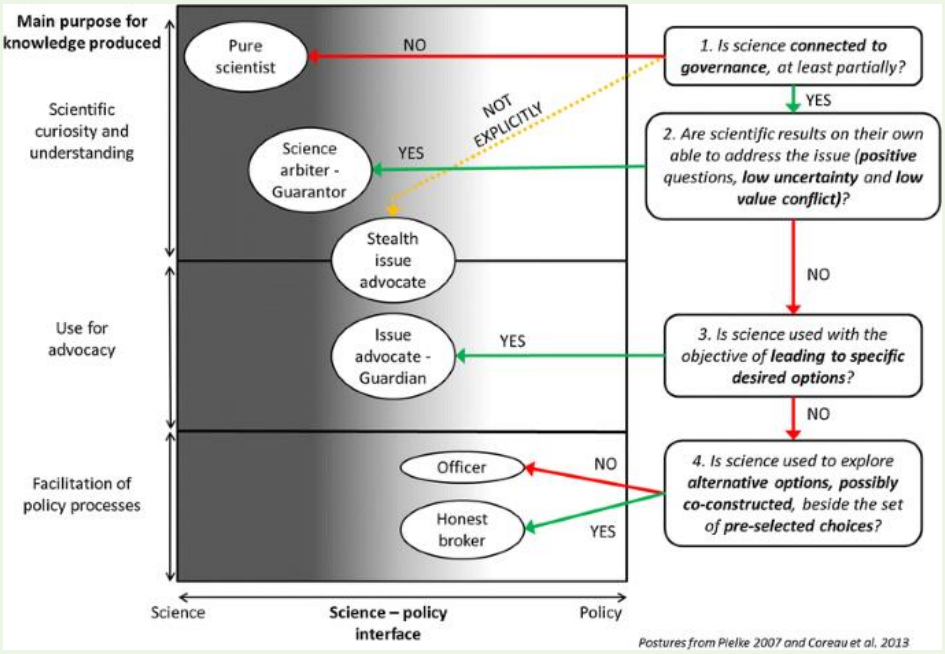

Figure 9: Decision tree for identifying positionality.

Note. From "Researchers must be aware of their roles at the interface of ecosystem services science and policy," Crouzat et al., 2018, *Ambio*, *47*(1), p. 100 (https://doi.org/10.1007/s13280-017-0939-1). Copyright 2017 by Royal Swedish Academy of Sciences.

Note: Based on Crouzat et al., 2018; Koot et al., 2020; Leventon et al., 2021; and Olmos-Vega et al. (2022).

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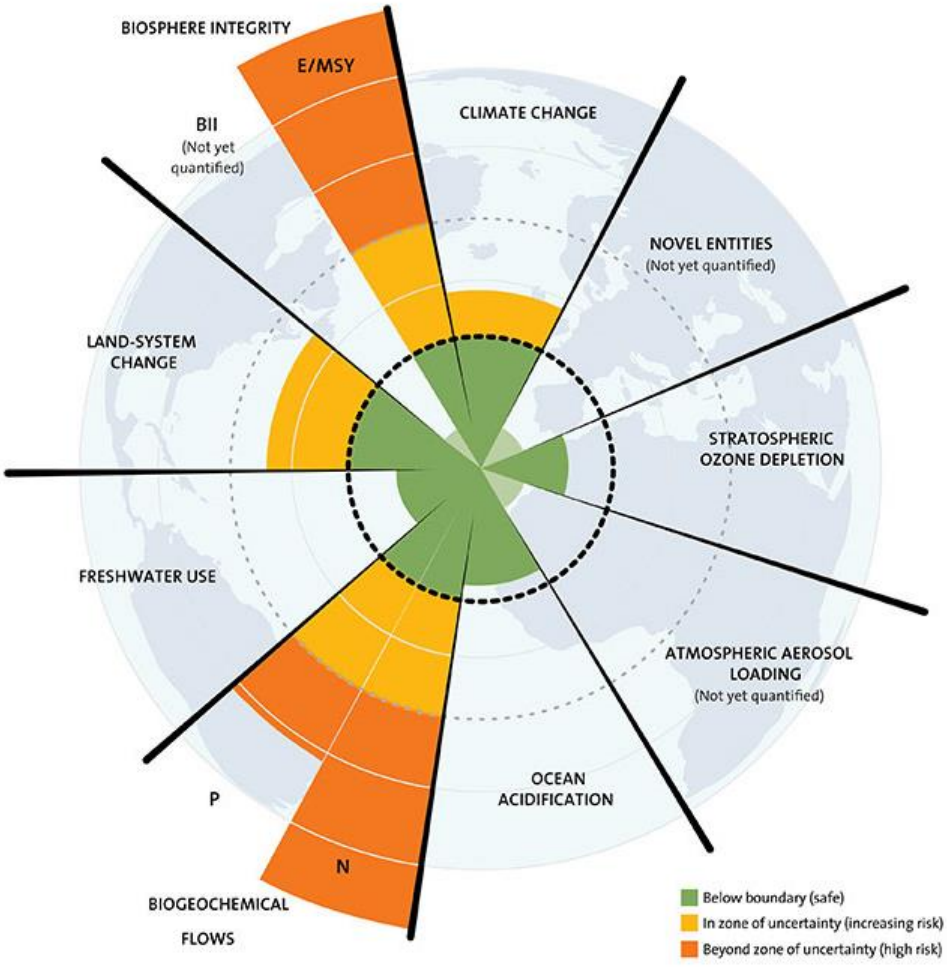
Appendix A

Figure B1. The nine planetary boundaries.



Note. From "The nine planetary boundaries," by the Stockholm Resilience Centre, n.d.a, (https://www.stockholmresilience.org/research/planetary-boundaries/the-nine-planetary-boundaries.html). CC BY-NC-ND 3.0.

Appendix B

Table B1: the social foundation and its indicators of shortfall (boundary: 0% shortfall).

Dimension	Illustrative indicators (% of global population)	%	Year	Data source
Food	Population undernourished	11	2014-16	FAO
Health	Population living in countries with under-five mortality rate exceeding 25 per 1,000 live births	46	2015	World Bank
	Population living in countries with life expectancy at birth of less than 70 years	39	2013	World Bank
Education	Adult population (aged 15+) who are illiterate	15	2013	UNESCO
	Children aged 12–15 out of school	17	2013	UNESCO
Income & work	Population living on less than the international poverty line of $3.10 a day	29	2012	World Bank
	Proportion of young people (aged 15-24) seeking but not able to find work	13	2014	ILO
Water & sanitation	Population without access to improved drinking water	9	2015	WHO/UNICEF
	Population without access to improved sanitation	32	2015	WHO/UNICEF
Energy	Population lacking access to electricity	17	2013	OECD/IEA
	Population lacking access to clean cooking facilities	38	2013	OECD/IEA
Networks	Population stating that they are without someone to count on for help in times of trouble	24	2015	Gallup
	Population without access to the Internet	57	2015	ITU
Housing	Proportion of global urban population living in slum housing in developing countries	24	2012	UN
Gender equality	Representation gap between women and men in national parliaments	56	2014	World Bank
	Worldwide earnings gap between women and men	23	2009	ILO
Social equity	Population living in countries with a Palma ration of 2 or more (the ratio of the income share of the top 10% of people to that of the bottom 40%)	39	1995-2012	World Bank
Political voice	Population living in countries scoring 0.5 or less out of 1.0 in the Voice and Accountability Index	52	2013	World Bank
Peace & justice	Population living in countries scoring 50 or less out of 100 in the Corruption Perceptions Index	85	2014	Transparency International
	Population living in countries with a homicide rate of 10 or more per 10,000	13	2008-2013	UNODC

Note. Adapted from Supplementary appendix of "A Doughnut for the Anthropocene: humanity's compass in the 21st century" by Raworth, 2017, *The lancet planetary health*, *1*(2), p. 4 (https://doi.org/10.1016/S2542-5196(17)30028-1). CC BY 4.0.

7 Transformative Navigational Toolkit summary

This document provides a summary of D1.3. which is a confidential deliverable within the scope of TRANSPATH.

TRANSPATH WP 1 team

Report Summary

The Transformative Navigation Toolkit aims to support the development of so called 'safe and just operating spaces' (SJOS) for biodiversity, climate change, and human rights in context-based decision-making. The toolkit first introduces the SJOS concept at the global scale, drawing from both science and policy, to distil relevant climate, biodiversity, and human rights safeguards. Then, we discuss alternative approaches for operationalising the global SJOS at a range of contexts, providing guidance including relevant examples and principles drawn from science, policy, and practice. The toolkit then introduces the meaning and importance of a participatory approach to defining SJOSs and pathways leading to them, and provides a set of tools, including various methods, concepts, principles, and questions, which aim to enable both inclusive, open dialogue (also referred to as 'reflexive deliberation') and research in developing transformative pathways towards a safe and just future. Finally, we provide some very initial ideas on possible applications of this toolkit across TRANSPATH.

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