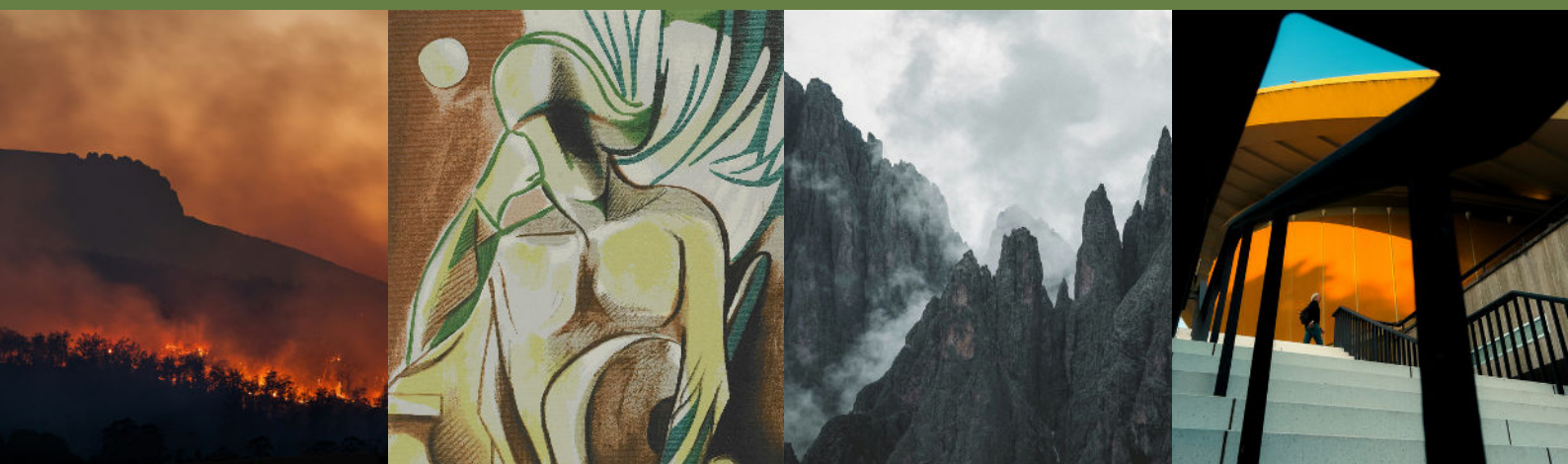
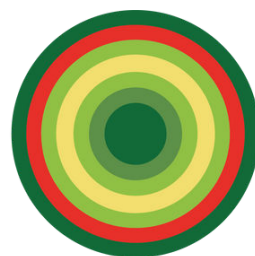


Horizon Europe Project PLANET4B

COMPENDIUM OF 11 TRANSFORMATIVE CHANGE STORIES



BETTER DECISIONS FOR BIODIVERSITY AND PEOPLE



PLANET4B



**Funded by
the European Union**

PLANET4B receives funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101082212.



**UK Research
and Innovation**

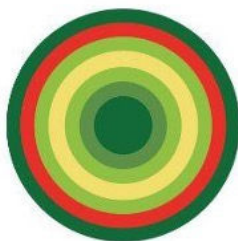
This project is funded by UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee.



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Views and opinions are of those of the authors only and do not necessarily reflect those of the European Union, European Commission, the government of the United Kingdom, or the government of Switzerland. The European Union, the European Commission, the government of the United Kingdom, or the government of Switzerland cannot be held responsible for them.



PLANET4B

BETTER DECISIONS FOR BIODIVERSITY AND PEOPLE

Key deliverable information

Project acronym PLANET4B

Project title	understanding Plural values, intersectionality, Leverage points, Attitudes, Norms, behaviour and social Learning in Transformation for Biodiversity decision making
Starting date	01 st November 2022
Duration	36 months
Website	https://planet4b.eu/
Project coordination and scientific lead team	Ilkhom Soliev; Alex Franklin; Agnes Zolyomi; Torsten Wähler

Deliverable number D3.3

Deliverable title	Compendium of 11 Transformative Change Stories
Task leader	Interdisciplinary Research Centre for Technology, Work and Culture (IFZ)
Corresponding author	Sandra Karner
Dissemination level	Public
Status	Final

Deliverable description

This deliverable compiles the 11 Transformative Change Stories, which resulted from the work of 5 intensive place-based and 6 extensive sector-based cases.

Version	Status	Date	Authors/Reviewers
0.1	Draft	16/09/2025	Authors: Sandra Karner (IFZ); Eszter Kelemen (ESSRG); Alexander E. Aas-Hansen (OOF); David N. Barton (NINA); Mahsa Bazrafsan (FiBL); Tuva Beyer Broch (NINA); Lindy Binder (CU); Reidun Bolsø (OOF); Marta Bonetti (UNIPi); Yennie K. Bredin (NINA); Geraldine Brown (CU); Maryna Bykova (CGE); Rafal P. Chudy (NINA); Kármén Czett (ESSRG); Helene Figari (NINA); Alex Franklin (CU); Vegard Gundersen (NINA); Robert Home (FiBL); Johan Hval (OOF); Cristina Y. A. Inoue (RU); Borbála Lipka (ESSRG); Geeta Ludhra (DC); Subash Ludhra (DC); Mariana Matoso (CGE); Vinícius Mendes (RU); Andreas Motschiunig (FUG); Pedro Navarro Gambín (UNIPi); György Pataki (ESSRG); Ghezal Sabir (FiBL); Katharina

			Santer (FUG); Christina Seliger (FUG); Ilkhom Soliev (MLU); David Steinwender (IFZ); Lina Tennhardt (FiBL); Anita Thaler (IFZ); Matteo Villa (UNIPi)
0.2	Draft	16/09/2025	Reviewer: Eszter Kelemen (ESSRG)
0.3	Draft	23/09/2025	Authors: Sandra Karner (IFZ); Eszter Kelemen (ESSRG); Alexander E. Aas-Hansen (OOF); David N. Barton (NINA); Mahsa Bazrafsan (FiBL); Tuva Beyer Broch (NINA); Lindy Binder (CU); Reidun Bolsø (OOF); Marta Bonetti (UNIPi); Yennie K. Bredin (NINA); Geraldine Brown (CU); Maryna Bykova (CGE); Rafal P. Chudy (NINA); Kármén Czett (ESSRG); Helene Figari (NINA); Alex Franklin (CU); Vegard Gundersen (NINA); Robert Home (FiBL); Johan Hval (OOF); Cristina Y. A. Inoue (RU); Borbála Lipka (ESSRG); Geeta Ludhra (DC); Subash Ludhra (DC); Mariana Matoso (CGE); Vinícius Mendes (RU); Andreas Motschiunig (FUG); Pedro Navarro Gambín (UNIPi); György Pataki (ESSRG); Ghezal Sabir (FiBL); Katharina Santer (FUG); Christina Seliger (FUG); Ilkhom Soliev (MLU); David Steinwender (IFZ); Lina Tennhardt (FiBL); Anita Thaler (IFZ); Matteo Villa (UNIPi)
0.4	Draft	24/09/2025	Reviewers: Alex Franklin (CU); Ilkhom Soliev (MLU); Agnes Zolyomi (MLU)
0.5	Draft	29/09/2025	Authors: Sandra Karner (IFZ); Eszter Kelemen (ESSRG); Alexander E. Aas-Hansen (OOF); David N. Barton (NINA); Mahsa Bazrafsan (FiBL); Tuva Beyer Broch (NINA); Lindy Binder (CU); Reidun Bolsø (OOF); Marta Bonetti (UNIPi); Yennie K. Bredin (NINA); Geraldine Brown (CU); Maryna Bykova (CGE); Rafal P. Chudy (NINA); Kármén Czett (ESSRG); Helene Figari (NINA); Alex Franklin (CU); Vegard Gundersen (NINA); Liene Hennig (FiBL); Robert Home (FiBL); Johan Hval (OOF); Cristina Y. A. Inoue (RU); Borbála Lipka (ESSRG); Geeta Ludhra (DC); Subash Ludhra (DC); Mariana Matoso (CGE); Vinícius Mendes (RU); Andreas Motschiunig (FUG); Pedro Navarro Gambín (UNIPi); György Pataki (ESSRG); Ghezal Sabir (FiBL); Katharina Santer (FUG); Christina Seliger (FUG); Ilkhom Soliev (MLU); David Steinwender (IFZ); Lina Tennhardt (FiBL); Anita Thaler (IFZ); Matteo Villa (UNIPi); Torsten Wähler (MLU); Agnes Zolyomi (MLU)
1.0	Final	06/10/2025	Reviewer: Torsten Wähler (MLU)

Recommended citation

Karner, S., Kelemen, E., Aas-Hansen, A. E., Barton, D. N., Bazrafsan, M., Beyer Broch, T., Binder, L., Bolsø, R., Bonetti, M., Bredin, Y. K., Brown, G., Bykova, M., Chudy, R. P., Czett, K., Figari, H., Franklin, A., Gundersen, V., Hennig, L., Home, R., Hval, J., Inoue, C. Y. A., Lipka, B., Ludhra, G., Ludhra, S., Matoso, M., Mendes, V., Motschiunig, A., Gambín, P.N., Pataki, G., Sabir, G., Santer, K., Seliger, C., Soliev, I., Steinwender, D., Tennhardt, L., Thaler, A., Villa, M., Wähler, T., & Zolyomi, A. (2025). Compendium of 11 Transformative Change Stories. Report No D3.3 of the Horizon Europe Project 101082212 – PLANET4B. Brussels: European Research Executive Agency. DOI: 10.5281/zenodo.17250995

Rights and license

This work is licensed under a Creative Commons Attribution 4.0 International License. The Creative Commons Attribution license allows re-distribution and re-use of a licensed work on the condition that the creator is appropriately credited. [Read more](#).

Acknowledgements

The PLANET4B team would like to thank all interviewees, workshop participants, members of Learning Communities and Stakeholder Boards for their time and willingness to share their expertise, experiences, perspectives, and ideas. Their openness and commitment have been essential in shaping the Transformative Change Stories and in grounding the project's work. We also extend our gratitude to the local partner organisations, whose dedication and kind support enabled inclusive co-creation processes. All these contributions have been vital to the success of our work. Finally, the place-based case study teams would also like to warmly thank Petra Herout for her valuable support and patient guidance in tailoring the SoE method to the specific contexts of our case studies.

List of abbreviations and acronyms

Acronym	Definition
BES ^t Graz	Bio-/Diverse Edible City Graz
CAP	Common Agricultural Policy
CGE	Culture Goes Europe e.V.
CSDDD	Corporate Sustainability Due Diligence Directive
CU	Coventry University
D	Project Deliverable
DC	Dadima's CIC
ESG	Environmental, Social, and Governance
ESSRG	Environmental Social Science Research Group
EU	European Union
EUDR	European Union's Deforestation Regulation
FiBL	Research Institute of Organic Agriculture
FUG	Forum Urban Gardening
IFZ	Interdisciplinary Research Centre for Technology, Work and Culture
IPLC	Indigenous Peoples and Local Communities
LC	Learning Community
MLU	Martin Luther University Halle-Wittenberg
NINA	Norwegian Institute for Nature Research
PLANET4B	understanding Plural values, intersectionality, Leverage points, Attitudes, Norms, behaviour and social Learning in Transformation for Biodiversity decision making
RU	Radboud University
SB	Stakeholder Board
SoE	Systematisation of Experiences
TCS	Transformative Change Story
UNEP-WCMC	UN Environment Programme World Conservation Monitoring Centre
UNIFI	University of Pisa

Table of Contents

Key deliverable information	iii
Acknowledgements	v
List of abbreviations and acronyms	vi
Executive summary	3
1 Introduction	4
2 Methodological approach	9
2.1 Evidence base of the Transformative Change Stories	10
2.2 Systematisation of Experiences	11
2.3 Validation Workshops	13
2.4 Cross-case-study workshops	13
2.5 Reflection on the limitations of the work	15
3 The 11 Transformative Change Stories	16
3.1 Five place-based TCSs: Transformations on the ground	17
3.2 Six sector-based TCSs: Transformations across sectors	29
4 Points of transformative change	41
4.1 Creative safe spaces	42
4.2 Knowledge co-creation and sharing	45
4.3 Agency	49
4.4 Partnering instead of separation	51
4.5 Regulations for social and environmental justice	53
4.6 Bringing the elements together: scaling transformative change	56
5 Insights across Transformative Change Stories	57
5.1 Biodiversity as a social-ecological issue	57
5.2 Values, mindsets, and cultural change	57
5.3 Biodiversity and belonging	58
5.4 Intersectionality	58
5.5 Power and representation	58
5.6 Policy-institutional environment and governance	59
5.7 Local-global interlinkages	59
6 Challenges and tensions	60
7 Conclusions and outlook	62
References	64
Statement on data availability	66
Statement on ethics	66
Annex	67

Evidence base for TCS (Annex 1)	67
Guiding questions for the preparation of Transformative Change Stories (Annex 2)	72
Guidance on Transformative Change Story (Annex 3).....	74
Enabling intersectional nature recreation and biodiversity stewardship for urban resilience (Annex 4)	75
Youth4Biodiversity (Annex 5)	78
Opening Up Nature and the Outdoors to Black, Asian, and Ethnic Minority Communities: How Community-Led Action Is Integral to Reshaping the Future of Inclusive Biodiversity Decision Making in the UK (Annex 6).....	85
Swiss farmers’ religious and spiritual beliefs and biodiversity (Annex 7)	96
Planting Seeds of Change: growing into a community-led experiment in cultivating both biodiversity and belonging (Annex 8)	102
Uncovering Psychological Barriers to Biodiversity-Positive Finance (Annex 9).....	109
Reimagining Trade for Biodiversity and Justice (Annex 10)	112
The Way of the Seeds: The Case of Open-Pollinated Vegetable Seeds (Annex 11)	116
A transformative change story in biodiversity education (Annex 12).....	119
What should we wear on a planet in peril? Twelve key messages about transformative change for fashion and biodiversity (Annex 13)	124
Fostering biodiversity-friendly farming practices in a sector that relies on labour migration (Annex 14).....	131
Agenda: Transformative Change Stories – cross-case meeting WS1 (Annex 15)...	136
Agenda: Transformative Change Stories – cross-case meeting WS2 (Annex 16)...	137
Guidance for Documentation of the Systematisation of Experience (Annex 17).....	138
Guidance for Documentation of Validation Workshops (Annex 18)	149

Executive summary

This deliverable (D3.3) presents the ***Compendium of 11 Transformative Change Stories (TCSs)*** developed within the PLANET4B project as part of Task 3.3 “Validating and sharing the main learning points”. The stories show how biodiversity-related decision-making is inseparable from social practices, values, identities, and institutions, and how participatory approaches can generate pathways toward more just and biodiversity-positive futures.

The 11 stories cover two clusters: i) five place-based cases focusing on intersectional nature recreation and biodiversity stewardship in Oslo, city food for biodiversity and inclusion in Graz, opening nature and the outdoors to minority communities in the UK, urban youth engagement with biodiversity in Germany, and religious attitudes towards agriculture and biodiversity in Switzerland; and ii) six sector-based cases centred around agrobiodiversity, education, migrant workers, fashion, finance, and trade. Despite their diversity, they converge on a shared insight: biodiversity is never only an ecological concern, but a social–ecological one, intertwined with belonging, justice, governance, and everyday life.

Across these cases, five points of transformative change emerged:

- 1) Creative safe spaces dismantle barriers of exclusion, nurture trust, and enable embodied and emotional engagement with biodiversity.
- 2) Knowledge co-creation and sharing integrate diverse forms of expertise, confront biases, and encourage experimentation and learning through practice.
- 3) Agency grows as participants move from passive involvement to stewardship and advocacy, often beginning with small everyday actions.
- 4) Partnerships across cultural, community, and sectoral divides create living networks that sustain collaboration and generate cross-sectoral dialogue.
- 5) Regulations for social and environmental justice prove essential, showing that flexible frameworks can enable sufficiency, circularity, and grassroots innovation, rather than imposing rigid templates.

The compendium also highlights broader cross-cutting insights. Biodiversity consistently appears as a social–ecological issue embedded in cultural values and mindsets. Transformation requires cultural shifts toward care, sufficiency, reciprocity, and stewardship. Belonging emerged as both a precondition and an outcome of biodiversity action, while intersectionality revealed how overlapping inequalities – linked to gender, class, migration, ethnicity, or disability – shape both vulnerabilities and capacities. Policy-institutional environments and governance were shown to be decisive in enabling or constraining change, and local initiatives were consistently connected to global systems of trade, finance, and regulation.

Recurring challenges and tensions cut across the stories: sustaining participation over time, balancing grassroots autonomy with institutional anchoring, reconciling experiential learning with policy metrics, and addressing economic and structural drivers of biodiversity loss. Yet these tensions are also productive arenas where innovation, negotiation, and new alliances emerge.

Taken together, the Transformative Change Stories demonstrate that transformative change to safeguard biodiversity is possible, but only when ecological and social

dimensions are addressed simultaneously. They show that cultivating values of care, enabling inclusive communities, embedding intersectionality, reforming institutions, and linking local initiatives with global structures are essential steps toward biodiversity-positive and socially just futures.

1 Introduction

The PLANET4B project tackles a crucial gap in biodiversity governance: placing people – especially those historically excluded – at the heart of decision-making and transformation. Biodiversity and nature’s contribution to people is not simply a “green” concern for environmental sectors, but a fundamental condition of our societies, including justice, well-being, and sustainable futures (IPBES, 2019). Achieving lasting, socially just change that halts the current alarming rate of biodiversity decline requires more than technical fixes or ecological targets, which remain dominant in policy solutions (IPBES, 2022). It calls for behavioural and institutional shifts that activate sustainability-aligned values and empower diverse communities as co-creators and stewards of biodiverse places (Pascual et al., 2023). Biodiversity prospers on the ground when it becomes part of everyday life, rooted in the social, cultural, and economic context of communities, and when governance creates space for genuine participation, equity, and shared stewardship, that is, when the diverse values of nature are weaved into decisionmaking at multiple levels, from individuals through communities to society as a whole (Kelemen et al., 2023).

The IPBES Transformative Change Assessment concluded that transformative change is not only urgent and challenging but also achievable (IPBES, 2024). It requires though that, beside the direct drivers, the underlying causes of biodiversity loss are also addressed: i) the disconnection from nature and people, ii) the concentration of power and wealth, and iii) the prioritisation of short-term, material gains (IPBES, 2024). A systemic approach to tackle these root causes can be developed by aligning changes at the intrapersonal level (i.e. in views), at the interpersonal level (i.e. in practices), and at the institutional level (i.e. in structures) (Barton et al., 2024: project deliverable [D1.5 Transdisciplinary diagnostic framework for biodiversity decision-making assessment](#)). Although empirical examples are rare on how transformation at these levels can generate systemwide impacts, fractal approaches to transformation suggest that even small-scale initiatives can have a profound scaling effect if they focus on universal values and thus evoke resonance across diverse actors (O’Brien et al., 2023).

International policy processes increasingly mirror this perspective. For instance, both the [Kunming-Montreal Global Biodiversity Framework](#) and the [EU Biodiversity Strategy 2030](#) outline ambitious objectives to transform the relationship between nature and society, and to bring nature back into our lives, framing the core of the problem as a separation between human and non-human nature. As possible solutions, both of these documents refer to an all-of-society approach, where inclusion, social justice, learning, and financial reallocation all play critical roles, supported by open and transparent governance processes across scales and sectors.

While this proliferation of the transformative change concept in strategic policy documents and research papers can indicate a growing commitment, it might also risk dilution and the re-packaging of old, end-of-pipe solutions as steps towards

transformation (Vogel and O'Brien, 2022). In science, changes at the intrapersonal, interpersonal and institutional levels are often considered mutually reinforcing, and the potential trade-offs, vulnerabilities, or unintended consequences emerging from transformational processes remain hidden (Inieta-Arandia and Ravera, 2025). In the physical world, abrupt biodiversity decline accelerates, while in politics the narratives around security, economic stability, competition, and short-term solutions gain momentum, as many parts of the world face severe geopolitical crises (Chai et al., 2024; Nowak et al., 2023).

In this context, publishing Transformative Change Stories from a handful of Europe-based case studies seems to be just a drop in the ocean. Still, this deliverable would like to share promising examples of transformative change. Through the 11 stories, co-created over the course of 3 years, we aim to:

- inspire local communities, public and economic actors on how to sow and nurture the seeds of transformation,
- assess transformational process from an intersectional approach to identify critical components of socially just transformations; and
- identify common patterns of change that emerge in different localities, contexts and sectors, which can be considered as indications of a fractal-like scaling of transformation.

About this report

This ***Compendium of 11 Transformative Change Stories*** (project deliverable D3.3) is the third in a series of reports produced within PLANET4B Work Package 3:

- [D3.1 “Learning Communities and sectoral Advisory Boards established for 5 intensive place-based and 6 extensive sector-based case studies”](#) (Mendes et al., 2023) This deliverable documented the establishment of the 11 cases, describing the composition of Learning Communities (LCs) and Stakeholder Boards (SBs), and the co-defined learning objectives. It also reflected on how quintuple-helix and intersectionality principles were applied in shaping participation.
- [D3.2 “Report on the system mapping and leverage points for each case”](#) (Loučková et al., 2024): This deliverable compiled system maps and leverage points across all cases, showing how transformative interventions were identified to address the structural drivers of biodiversity loss.

By connecting back to these reports, D3.3 demonstrates how the establishment of LCs and SBs (D3.1) and the identification of leverage points (D3.2) informed the development of the Transformative Change Stories (TCSs) presented here. Together, these three deliverables outline a cumulative process, from setting up participatory structures to analysing systems and leverage points, to narrating stories of transformative change that integrate evidence and lived experiences from our case studies.

Two clusters of case studies

To explore these dynamics, PLANET4B developed 11 research-based case studies within and beyond Europe, organised into two clusters: five intensive, place-based cases and six extensive, sector-based cases. Together, they illuminate how transformative change emerges in situated community contexts and across wider systems such as trade, finance, fashion, agriculture and education.

Our research approach

The overall methodological design of PLANET4B was not only about documenting and understanding existing realities and change but also about testing how innovative research methods can foster change (see project deliverable [D2.2 Report on pre-test and pre-validation of contextualised intervention methods](#), Franklin et al., 2024). This approach shaped both the place-based and the sector-based cases, but in different ways.

In the **place-based cases**, Learning Communities were established, where a series of co-designed research interventions were implemented, ensuring that methods were rooted in everyday realities and sensitive to local contexts. A strong commitment to participatory action research and contextualisation guided this work. Activities were carefully tailored to social realities, political dynamics, and actor constellations, enabling interventions that resonated with participants' lived experiences and priorities. Research teams worked in close cooperation with the project's practice partners, local community groups, and supportive stakeholders to both understand and catalyse transformation on the ground.

The **sector-based cases** engaged with broader systems of governance. The participatory elements of the methodological design centred on Stakeholder Boards, which convened experts, practitioners, and institutional actors to examine structural barriers and opportunities for biodiversity-positive change. Rather than testing practices in specific local settings, these cases synthesised knowledge across policy frameworks, supply chains, and professional practices. They revealed how sectoral dynamics, such as trade, finance, fashion, or education, shape both the drivers of biodiversity loss and the levers for systemic transformation. By bringing together diverse professional voices, the sector-based cases created spaces for critical reflection on institutional norms, exploration of synergies across domains, and co-production of recommendations for governance and decision-making beyond individual communities.

Intersectionality

Across both clusters, the research was guided by an explicit intersectional approach (see project deliverable [D1.3 Methodological framework for intersectionality analysis](#): Thaler et al., 2023). This perspective recognises that inequalities linked to gender, class, age, migration background, race, and ability do not operate in isolation but overlap to shape people's vulnerabilities and capacities in relation to biodiversity. In the place-based cases, this meant revealing, anticipating and addressing the barriers that excluded certain groups from participation, and designing inclusive processes that engaged and valued diverse life experiences, situated knowledges, and perspectives. In the sector-based cases, the intersectional lens revealed how global structures, such as trade regimes, financial flows, or labour markets, and institutional settings, including the education system or regulatory frames, produce differentiated responsibilities,

opportunities, and burdens across regions and communities. By embedding intersectionality throughout PLANET4B, we ensured that questions of justice, equity, and inclusion remained central to both our interventions and the analysis.

Taken together, the two clusters of case studies offer various lenses on transformation, revealing how change can be nurtured from the ground up, how systemic structures and institutional frameworks can either enable or constrain such efforts.

Purpose of the Transformative Change Stories

The 11 Transformative Change Stories (TCSs) emerged from collaboration with Stakeholder Boards (sector-based cases) and Learning Communities (place-based cases), which provided participatory spaces where diverse forms of knowledge were brought into dialogue and validated.

The TCSs aim to make biodiversity transformation tangible and actionable, offering evidence and inspiration for practitioners, civil society actors, policymakers, and researchers, and encouraging the co-design of biodiversity-positive interventions. The stories weave together research evidence, lived experiences, and positive visions of the future into narratives designed to engage diverse audiences.

To maximise access and impact in communicating the stories, they were produced in multiple customised formats (see overview

Table 1): presentations, texts, infographics, films, and exhibitions – each crafted to engage different audiences in compelling ways. In Section 3 of this document, each story is presented in a concise and unified format. The Annex provides more detailed accounts of each TCS, diagnosing the problem, envisioning an alternative future, tracing pathways that connect the present to the future, and outlining the evidence base supporting these insights.

The 11 stories span a wide range of thematic fields, and they differ in how the individual case studies were implemented and which disadvantaged groups they addressed. Despite these differences, they share a common ambition aligned with the PLANET4B spirit: to reframe biodiversity not as a peripheral concern, but as a foundation of social well-being, justice, and sustainability. By embedding intersectional perspectives and amplifying diverse voices, they highlight the deep interconnections between biodiversity, social justice, and human well-being. In doing so, the stories point towards pathways of transformation that resonate across communities, sectors, and policy arenas.

Table 1. Overview of outputs based on the Transformative Change Stories¹.

Case	Formats of TCSs outputs	Aims of Communication	Target audiences
Intensive, place-based cases			
Inclusive nature recreation (Oslo, Norway)	- Workshop - NINA-booklet - Online breakfast	Inspire cross-sector collaboration for inclusive outdoor	- Outdoor recreation organisations - Health organisations

¹ All outputs are accessible through the PLANET4B website: <https://planet4b.eu>

NINA & OOF	- seminar - Academic articles	access; share findings with non-academic actors	(disabilities), Municipalities - Politicians - Researchers
Urban youth & nature (Erfurt, Germany) CGE & MLU	- Film - Booklet - Leaflet - Screenings - Conferences - Social media - Academic articles	Showcase youth-led transformations; inspire replication; provide evidence for policy; shift perceptions of youth.	- Youth groups - Educators - Youth workers - NGOs - Policymakers - Practitioner communities - Academia
BEST Graz – Bio-/Diverse edible city (Graz, Austria) IFZ & FUG	- Film - Policy dossier - Presentations (Academic) articles	Inspire civic engagement in shaping green spaces; inform municipality; provide evidence-based good practice; share learnings	- Civil society - Community centres - Urban gardening initiatives - Municipal authorities - Researchers
Ethnic minority communities & outdoor access (United Kingdom) DC & CU	- Participatory film - Tip sheets - Online exhibition - Infographics - Film - e-Book	Show community capacity for biodiversity action; support capacity building; share knowledge	- Ethnic minority families - Community-led organisations - Environmental organisations - Policymakers - Researchers
Religion & agro-biodiversity (Switzerland) FiBL	- Photo exhibitions - Podcasts - Community/church presentations - Newsletters (Academic) articles	Trigger ethical reflection on farming & biodiversity; highlight the role of spirituality; contribute to research	- General public - Farmers - Religious communities - Researchers
Extensive, sector-based cases			
Agrobiodiversity & seeds (Hungary) ESSRG	- Policy brief - Infograph: story map - Recipe book - Webinars	Empower seed savers; highlight grassroots role; encourage networking & peer learning	- Hobby gardeners - Small farmers - Seed networks - NGOs (Magház)

	• Presentations		
Trade & global value chains (EU & Brazil) RU	• Film • PowerPoint presentation • Teaching materials (schools, universities) • Photo documentation	Support EU/Dutch policy change (EUDR, CSDDD, CAP reform, finance); raise awareness among youth	• EU/Dutch policymakers • Students (schools/universities)
Fashion & biodiversity (Italy & Global) UNIPi	• Film • Presentation/booklet • Poster • Educational materials	Critique growth paradigm; promote sufficiency & biodiversity-conscious fashion; showcase alternatives	• Advisory board • Slow fibers companies • Students • Academic community
Education and environmental awareness (Hungary) ESSRG	• Infographics • 2 biodiversity lesson plans • Club of Rome chapter • IUCN case study • Scientific articles	Encourage school gardens; support teachers; promote systemic change in education	• Schools • Educators • Head masters • Policymakers
Agriculture & migration (Extensive)	• Podcast • Newspaper articles • Scientific articles	Raise debate on migrant labour in agriculture; question future farming visions	• General public • Policymakers • Researchers
Finance – sustainable investment behaviour (Norway & Global) NINA	• Chapter in Handbook of ESG Investing • Webinar • Presentations • Scientific publication	Raise awareness of cognitive biases in ESG investments; encourage better data & decision-making; inform policy & practice	• Investors • Policymakers • ESG professionals • Researchers

2 Methodological approach

The 11 Transformative Change Stories – presented in this compendium as short texts in section 3, and more comprehensive versions in the Annex – are grounded in transdisciplinary, creative, action-oriented, and participatory research. They emerged from carefully designed processes that combined stakeholder and community

engagement, experiential games, tailored arts-based and creative co-creation activities, system mapping, leverage point analysis, collective reflection, interviews, desk research, and validation workshops.

Data generation and intervention design differed between the five place-based and six sector-based cases. Place-based cases established Learning Communities that engaged citizens, grassroots groups, stakeholders and municipalities in experimenting with innovative methods and interventions (see project deliverable D2.2 [Report on pre-test and pre-validation of contextualised intervention methods](#)). Sector-based cases relied more strongly on desk research, literature reviews, and policy analysis, complemented by interviews, workshops with Stakeholder Boards and some arts-based and co-creative intervention activities.

Each TCS (Task 3.3) synthesised empirical evidence, reflective insights, and learnings, validated through participatory processes, and tailored in both substance and format to the envisaged impact and to the needs of specific audiences.

2.1 Evidence base of the Transformative Change Stories

The 11 Transformative Change Stories developed in PLANET4B are not free-floating narratives but are grounded in a rich and diverse evidence base. They build on systematic analysis, participatory research, and creative co-production processes that together capture both the analytical and experiential dimensions of transformative change. Table 3 “Evidence base for TCSs” in the Annex provides an overview of the different empirical data sources used by the 11 cases.

Empirical evidence was generated through LC activities (e.g. field notes, debriefing documentation), single interventions implemented by both place- and sector-based cases, and deliberative formats such as workshops with Stakeholder Boards and policy dialogues. These data were complemented by interviews and surveys, in the UK case additional data were gathered through WhatsApp exchanges within the LC.

System mapping and leverage point analysis were applied across all cases through a series of workshops (see project deliverable [D3.2 Report on the system mapping and leverage points for each case](#)). This helped to identify barriers and enabling conditions, as well as potential leverage points where relatively small interventions could trigger broader systemic change, as opposed to those leverage points that require large-scale and rather technical interventions without addressing the social drivers of identified challenges.

Arts-based and visual evidence were also integrated in several cases and used as the main instrument to communicate messages to broad audiences (see Table 1). For example, in Switzerland, the case study on religion and biodiversity used photo exhibitions both as a method to collect qualitative data and as an output which generates public dialogue, while the Urban Youth case in Germany co-produced films with young people to capture perspectives and emotions that written accounts could not convey.

Desk research and policy analysis were used to situate case-specific experiences within broader governance and policy frameworks. This was particularly important in sector-based cases but was also relevant for place-based cases.

Finally, structured reflection ensured that evidence was critically assessed and validated. While the sector-based cases collected feedback on their findings and draft TCS versions through Validation Workshops (see section 2.3), the place-based cases implemented structured group reflection workshops by using the Systematisation of Experiences (SoE) method (see section 2.2, below). This helped research teams and LC participants to reflect on the transformations that had occurred, to extract learnings, and to identify the enabling conditions, and the tensions and obstacles that persisted.

All these multiple streams of evidence, including fieldwork, stakeholder deliberation, analytical mapping, interviews, creative documentation, policy reviews, and structured reflections, provided a robust and triangulated foundation for the TCSs.

2.2 Systematisation of Experiences

All five place-based cases applied the “Systematisation of Experiences” (SoE) method to critically assess and document transformative interventions. Since the implementation of the SoE represented a central activity in the place-based cases, it is briefly described here.

In general, the SoE is a structured process of collective reflection that examines both the “gain points” and “pain points” of shared experiences (Luger & Cisneros, 2003; Herout & Schmid, 2015). Its purpose is to distil practice-based learnings, uncover enabling and hindering conditions, and generate insights for future action. The method traditionally follows four steps: (1) setting the framework, (2) reconstructing the history of the experience, (3) conducting a critical analysis, and (4) formulating lessons learned. In PLANET4B, this was extended by outlining a narrative of change to feed directly into the elaboration of Transformative Change Stories.

The SoE for each case needed to be tailored and thoroughly prepared by the facilitation teams. They took part in a training course on the method and, with support from an SoE expert, Petra Herout and the task lead, a customised framework and corresponding workshop designs were developed. Altogether, 24 online meetings were held with the five case study teams to set up the SoE workshop designs.

Variation in application

The SoE was implemented in diverse ways, reflecting the different contexts and LC settings of the cases. According to the Grant Agreement, the method was initially foreseen as a sequence of four workshops for each intensive case. In practice, however, it became clear that for most cases it was neither necessary nor feasible to conduct all steps in separate workshops. Instead, the process was adapted to the specific needs of each case study and to the availability of participants. This flexibility was granted to ensure that the SoE was not a rigid, one-size-fits-all procedure, but was implemented in forms that generated the most value for each case. Importantly, the SoE as a method provides substantial scope for designing its implementation, and PLANET4B deliberately used this openness to create tailored formats that best suited the case contexts.

In Switzerland, FiBL applied the method as an internal researcher reflection, drawing on experiences from a photo exhibition on spirituality and biodiversity. In contrast, the Austrian case convened a series of four workshops that brought together the project team – researchers from IFZ, practitioners from FUG – and representatives from both the women* LC and the policy LC. In Norway, the Oslo case implemented a one-day workshop bringing together NINA researchers and practitioners from OOF, focusing on inclusive outdoor recreation. The UK case embedded the SoE in a residential weekend, co-created by DC, CU, and the Black, Asian and other ethnic minority Learning Community. For the Urban Youth case, the SoE was designed as a hybrid activity between individual and collective participation, combining in-depth interviews with young people and documentation of their experiential learning activities, rather than holding a single group workshop.

Differences in participatory intensity

The level of participation also varied across cases. Some SoEs, like FiBL's, were reflective exercises for research teams, while others, such as the UK and Austrian cases, placed community voices at the centre of analysis. In these more participatory settings, participants not only provided data but also actively co-authored the interpretation of their experiences, thereby strengthening the legitimacy of the results and ensuring that the TCSs captured their perspectives.

Outcomes and contributions to TCSs

The SoE process in each case directly shaped the content and narrative of the Transformative Change Stories. In Switzerland, the SoE identified how a photo exhibition acted as a catalyst for dialogue across farmers, consumers, and faith communities. In Austria, the workshops generated both the storyline of the BEST Graz TCS and concrete proposals for the policy dossier presented to the municipality. In Norway, the SoE analysis connected municipal planning documents with organisational practices and individual experiences of children with disabilities, weaving them into a coherent story of inclusive nature recreation. In the UK, the residential SoE workshop produced collective narratives of empowerment and belonging that became central to the TCS. In Germany, interview-based reconstructions of the Urban Youth case highlighted themes of embodied learning, eco-anxiety, and behavioural change among urban youth, shaping the storyline around lived ecological citizenship.

Analytical and transformative role

Beyond producing evidence for the TCSs, the SoE method played a transformative role in itself. It created a structured space for dialogue between different groups, helping to build trust, surface tensions, and recognise diverse forms of knowledge. In the Austrian case, it bridged grassroots women gardeners and municipal policymakers. In the UK, it highlighted and valued the contributions of ethnic minority families as essential participants in biodiversity discourse. In Norway, it enabled the project team – practitioners and researchers – to jointly reflect on inclusion practices and the potential influence of research on policy decisions. In Switzerland, the SoE supported the team in reflecting on how farmers' spiritual values could be respectfully integrated into biodiversity debates through a photo exhibition, as well as how such an exhibition could serve as a valid research method. In the Urban Youth case, the SoE provided an opportunity to revisit the interventions by listening to the LC participants' stories and capturing the emotional, social, and intellectual layers of their experiences. These

reflections went beyond data collection, creating spaces of mutual appreciation and recognition that deepened relationships and empowerment. Across the cases, the SoE contributed not only to knowledge generation but also to relationship building, thereby strengthening the social foundations for ongoing change.

In sum, the SoE served as a cornerstone of the methodological approach in place-based cases. It provided a rigorous yet flexible structure for reflection, generated practice-based insights, and ensured that the resulting stories were grounded in lived experiences while also highlighting systemic enablers and constraints.

2.3 Validation Workshops

In parallel, the sector-based cases held validation workshops with key informants and Stakeholder Board members. These sessions reviewed the researchers' analyses, helped refine the results, and reviewed draft outlines of the TCSs, utilising diverse formats and participant constellations. The Hungarian education and Italian fashion cases were held in person, bringing together practitioners, experts, and civil society actors for more interactive exchanges. By contrast, the case on agriculture & migration, as well as the global trade case, relied on shorter online sessions with experts and NGOs. The Hungarian agrobiodiversity case, on the other hand, organised two separate online workshops. The case on finance held, instead of a validation workshop, two stakeholder board meetings, where the key assumptions of the case study were thoroughly discussed and validated.

Across all sector-based cases, the workshops or the meetings tested the robustness of the TCSs, verified the accuracy and relevance of findings, and co-developed recommendations and dissemination formats. Validation activities largely confirmed the core visions and leverage points (see project deliverable [D3.2 Report on the system mapping and leverage points for each case](#)) while suggesting refinements to improve accuracy, feasibility, and policy relevance. In Hungary, education stakeholders encouraged broadening the narrative beyond school gardens to the wider school environment, while the agrobiodiversity-related workshops validated the vision with seed savers and refined leverage points with experts. In Italy, fashion stakeholders prioritised systemic changes, anchoring the story around sufficiency and redistribution. In both the trade case and the agriculture and migration case, participants endorsed the findings but called for stronger integration of fieldwork data and clearer policy pathways. The workshops also generated ideas for dissemination and collaboration, such as embedding results in school communities, informing NGO advocacy, and feeding into debates on EU seed law or trade regulation. In this way, they consolidated stakeholder buy-in, enriched the stories with practical insights, and clarified potential pathways for their use in both policy and community contexts.

2.4 Cross-case-study workshops

In addition to the reflections, feedback, and validation activities conducted within each case, bilateral meetings of cases with PLANET4B work package (WP) and task leads were held, and a series of peer workshops were organised across the 11 case studies (see overview Table 2). The purpose of these sessions was to facilitate mutual exchange and cross-fertilisation of ideas between cases. They offered case study teams the opportunity to gain insights into interim results and the plans for other cases' stories, while drawing inspiration for the development of their own TCSs. The

workshops also provided a structured setting for team members to give and receive critical feedback, both on the substantive content of the TCSs and on the planned or draft formats for their presentation. Furthermore, the sessions sought to identify commonalities across cases, in terms of both thematic focus and output formats, thereby laying the groundwork for bilateral follow-up exchanges and opportunities for mutual support in the subsequent refinement, production and dissemination of the TCSs.

Table 2. Overview of meetings.

Date	Type of meeting	Participants	Core content
16 May 2024	Online	Intensive and extensive case study representatives; WP2, WP4 partners	Every case was briefly explained their progress with interventions/research activities. Methodological support was provided during the leverage points workshop, and an interactive exercise was conducted to map expected impacts across the cases.
August – September 2024	Online	Intensive and extensive case study representatives; WP4 partners	One-by-one online interviews with every case to assess and reflect on the case study's impact, including both observed and potential (expected broader) impact.
25 September 2024	Online	Intensive case study representatives	Online training on the SoE methodology
9–10 October 2024	In-person consortium meeting	Whole consortium	Specific sessions dedicated to expected impact and SoE, study trip to the Hungarian agrobiodiversity case (meeting with two members of the stakeholder board and testing arts-based interventions).
December 2024 – January 2025	Online survey	Intensive and extensive case study representatives	Case studies completed a detailed survey on the planned content, format, and methods for disseminating their TCSs. These plans were continuously updated by case study teams.
16 January 2025	Online	Intensive and extensive case study representatives; WP4 partners	A cross-case meeting was dedicated to exchanging stories of transformative change, using inspiring examples and engaging in interactive group work.
19 February 2025	Online	Intensive case study representatives	An online workshop was held to discuss the SoE process (progress, outcomes).
March – April 2025	Online	Intensive and	One-by-one online interviews with every case on

		extensive case study representatives	the progress with the TCS, the SoE and validation workshops, and the planned outputs.
22 April 2025	Online	Intensive and extensive case study representatives	Online cross-case meeting with a focus on finalising the TCSs.
8 May 2025	Online	Intensive case study representatives; WP2, WP4, WP5 participants	Online interactive workshop to reflect on the achieved impacts by intensive cases (validating impacts, missing impacts, evidencing impacts).
14 May 2025	In-person interactive session	2 extensive and 3 intensive case representatives; WP2 and WP5 participants	An interactive special session was organised as part of the Alternet conference, where PLANET4B cases showcased their TCSs and analysed them across three main aspects (conceptualising transformative change, methods to foster transformative change, impacts observed/achieved).
26 May 2025	Online	Extensive case study representatives; WP2, WP4, WP5 participants	Online interactive workshop to reflect on the potential impacts of extensive cases (validating impacts, missing impacts, evidencing impacts).
9 September 2025	In-person consortium meeting	Intensive and extensive case study representatives	Two sessions were dedicated to the TCSs produced by intensive and extensive cases.

2.5 Reflection on the limitations of the work

Although the TCSs represent highly valuable outputs, our work also faced some limitations.

Time and resource constraints meant that only a certain number of people and groups could be involved in the cases, leaving some voices missing or difficult to sustain over longer periods. Keeping local actors and stakeholders engaged proved to be much easier through interactive, artistic, experiential or gamified approaches, while more “mainstream” tools, such as online or face-to-face workshops, attracted fewer participants.

Locating the case studies in diverse fields and dividing them into two methodological clusters broadened the insights gained but made direct comparison more difficult. Place-based, intensive cases could provide insights into transformative impacts triggered by the applied interventions mostly at the individual and the community level. Sector-based, extensive cases, on the other hand, studied (the potentials of)

transformative change at the institutional level, but primarily through secondary sources (i.e. documentary analysis, interviews or expert workshops) instead of direct interventions.

While the SoE and TCS frameworks were designed to ensure comparability, some teams found them restrictive, and balancing storytelling with analytical rigour remained a challenge. At the same time, teams had considerable freedom regarding the content and format of their TCSs, which created some insecurity about what was expected. All case studies generated a rich body of material, yet distilling the most relevant key messages into concise stories proved demanding. Collaborating with activists and artists (or researchers with artistic skills) made it easier to display the TCSs in creative and engaging formats, but such expertise was not available for all the case studies. Furthermore, certain outputs, such as embodied or artistic forms of knowledge, were difficult to translate into policy-relevant formats, reflecting a structural bias toward quantifiable metrics.

The sector-based cases would have benefited from greater resources to implement interventions on the ground, while the place-based cases, though firmly embedded in local networks and policy contexts, could only touch upon wider or global perspectives, even though many of the challenges they addressed originate at European or global levels. Looking ahead, it will be important to widen participation, give more space to diverse ways of knowing, and strengthen the links between local experiments and broader systemic changes – in both directions.

Engaging closely with local actors and stakeholders also required researchers to be open-minded and flexible, often moving them out of their comfort zones. PLANET4B researchers brought different skillsets and attitudes to this type of participatory research, which shaped the way case studies were conducted. Cross-case meetings were initially designed to enable continuous reflection and peer learning within the research team to balance these differences, but in practice, many of these meetings focused on conceptual and methodological discussions rather than on learning from each other. This again might have contributed to the heterogeneity of the outputs.

3 The 11 Transformative Change Stories

This section presents abridged versions of the 11 Transformative Change Stories (TCSs) developed within the PLANET4B project, grouped into two thematic clusters. Each story offers insight into how biodiversity transformation unfolds in diverse contexts. These abridged versions were generated entirely from the full original stories using AI (Copilot), with human validation by Lindy Binder – drawing on her expertise in professional storytelling – and by each respective case study lead. The purpose of these shorter versions is to support wider dissemination and enhance impact through a consistent and accessible collection of narratives. The full, original versions of all TCSs are included in the Annex to this document.

The five place-based cases are rooted in specific communities and landscapes, where participatory action research became a catalyst for transformation. The six sector-based cases show how structural levers and policy-institutional change could open pathways to biodiversity-positive futures. Together, these stories reveal the diversity of

ways in which communities, sectors, and institutions can place biodiversity at the centre of just and sustainable transformations.

3.1 Five place-based TCSs: Transformations on the ground

The five place-based cases reveal how transformative change addressing biodiversity loss emerges when research interventions are woven into everyday lives, identities, and practices. They demonstrate how dialogue, empowerment, and cultural resonance turn abstract commitments into lived realities. Each case highlights the importance of creating safe, inclusive spaces where communities recognise themselves as co-stewards of biodiversity.

Story of Transformative Change: Opening Nature and the outdoors to Black, Asian and ethnic minority communities (Central England, United Kingdom)

From Margins to Momentum: Reclaiming Nature through Community-Led Inclusion

Context and Challenge

In the UK, Black, Asian, and other ethnic minority communities often face systemic barriers to engaging with the natural environment. Despite long-standing cultural and spiritual connections to the land, these groups remain underrepresented in environmental leadership, outdoor activities, and biodiversity decision-making. Structural racism, uneven access to green spaces, and a shortage or exclusion of culturally relevant initiatives have together produced what researchers describe as a form of “green inequality.”

The PLANET4B project highlights green inequality as a critical leverage point for change. If we want a just and sustainable future, nature-based engagement must become far more inclusive. This means rethinking not only who has access to green spaces, but also who shapes the decisions about land, conservation, and biodiversity.

The Turning Point

The turning point did not arrive with a single event, but through a series of quiet, meaningful exchanges. Over several workshops, members of a Learning Community began sharing personal stories, memories of gardens from childhood, ancestral landscapes, and everyday rituals. The WhatsApp group became a space of emotional connection and mutual learning. One participant, who had never considered herself part of the environmental conversation, shared how she now saw biodiversity in her own backyard. Another realised her food traditions were deeply tied to ecological cycles. These moments of recognition and of seeing oneself reflected in nature and understanding its place within personal histories became a marker of transformation. The belief that environmental action belonged to “other people” shifted toward a realisation that it also included us – that we are active participants in shaping these futures.

Transformative Change in Action

The transformation began with a group of thirteen individuals from South Asian and African heritage, brought together through a Learning Community facilitated by Coventry University and the grassroots organisation Dadima's CIC. For many

participants, the countryside had long felt like a space of exclusion – marked by microaggressions, unfamiliarity, and a sense of not belonging.

But Dadima's offered something different. Rooted in intergenerational wisdom and cultural storytelling, the group created a space where participants could share their everyday nature experiences without judgment. Walks through the Chilterns countryside became moments of reflection, joy, and connection. One participant described a walk as a "pilgrimage," where watching a great-granddaughter pick daisies beside her great-grandfather became a celebration of heritage and healing.

The WhatsApp group evolved into a vibrant digital conversation. Members shared photos, reflections, and articles. They celebrated each other's milestones and discoveries. The online space became a living archive of community knowledge, emotional support, and biodiversity awareness.

Workshops and storytelling sessions helped participants explore their relationships with nature in new ways. For some, it meant reconnecting with memories of growing up in Africa, where gardens were filled with fruit trees and herbs. For others, it meant realising that biodiversity wasn't just about distant rainforests – it was about the lemongrass growing in their mother's backyard, or the birdsong on a morning walk.

As confidence grew, so did action. Participants began to see themselves not just as visitors to nature, but as stewards of it. They reflected on how their choices – what they ate, how they gardened, travelled, how they spoke to others – could influence biodiversity. One participant shared how she had once felt overwhelmed by the idea of "saving biodiversity," but through the project, she realised that small, local actions mattered. "I thought I couldn't do it on a smaller scale," she said. "But I didn't realise it could be this simple."

Since becoming involved in the project, one Learning Community member implemented a new recycling policy for printer cartridges at his work, one became a trustee of a local environmental organisation, and another is going to volunteer in a local school talking about biodiversity. The community has also collaborated with a filmmaker and a doodler to share their story in creative ways. The case study leaders have organised a conference bringing together key figures in UK nature and inclusion work to share insights from PLANET4B and open up knowledge exchange.

The collaboration with Dadima's CIC was central. As a trusted community-led organisation, Dadima's acted as a cultural bridge, translating environmental language into lived experience. It created a space where inclusion wasn't just about presence – it was about power, voice, and agency.

Alignment with PLANET4B Goals

This story embodies the PLANET4B vision in multiple ways:

- **Intersectionality:** The case centres on race, ethnicity, age, and cultural identity, highlighting how these intersect with access to biodiversity.
- **Behavioural and Institutional Change:** Participants moved from feeling uncertainty to becoming active agents of change, influencing both personal behaviour and community narratives.

- **Participatory and Creative Methods:** Storytelling, nature walks, and digital dialogue created emotional resonance and collective learning.
- **Leverage Points:** Community-led initiatives like Dadima's became key nodes for systemic transformation, challenging dominant narratives and practices in environmental spaces.

Outcomes and Vision

The UK Learning Community demonstrated that transformation occurs when creating safe spaces for reflection, connection, and leadership. We captured participants actively seeking ways to influence their families, communities, and local institutions. In doing so, they reframed biodiversity as something profoundly human, cultural, and relational.

The vision that emerged was one of a just and inclusive society – where all communities are empowered to engage with nature, participate in decision-making, and co-create a thriving, biodiverse future.

Lessons for Broader Application

- Inclusion must go beyond access to embrace agency and leadership.
- Community-led organisations are essential cultural brokers in environmental work.
- Emotional safety and cultural relevance are prerequisites for engagement.
- Everyday experiences and memories are powerful entry points for biodiversity awareness.
- Structural change begins with relational trust and shared ownership.

Story of Transformative Change: Urban Youth, Germany

From Disconnection to Agency: Empowering Urban Youth for Biodiversity Action in Erfurt

Context and Challenge

In Erfurt, a city in the German state of Thuringia, some young people feel disconnected from nature and excluded from environmental decision-making. Migrants, newcomers, and those from international communities are particularly affected, compounded by structural barriers such as language, migration status, and experiences of discrimination, particularly where far-right politics are more prominent.

The PLANET4B project recognised this as a critical leverage point. How can youth, especially those facing multiple forms of marginalisation, be empowered to engage with biodiversity and shape ecological futures?

The Turning Point

Culture Goes Europe (CGE), a local NGO with experience in youth activation, partnered with researchers from Martin Luther University Halle-Wittenberg to create a Learning Community – a group of people brought together to help co-design the research process and reflect on the usefulness of the tested methods. Youth were invited from diverse backgrounds – migrants, newcomers, and international students. The Learning Community space was designed to be inclusive, safe, and co-creative – where members could reflect, experiment, and act.

Through participatory workshops, nature-based retreats, and creative interventions, biodiversity became a shared language. Activities like outdoor cinema, experiential games, and hikes helped youth move from passive concern to active engagement. One participant noted, “You don’t need to be an expert – just being present and heard can be transformative.”

Transformative Change in Action

The transformation began with a simple idea: create a space where young people could feel safe, seen, and heard.

The first meetings were quiet. Many arrived feeling unsure of their place in environmental conversations. Biodiversity, for some, was a distant concept. Others had never been asked what nature meant to them.

But slowly, through shared meals, forest walks, and open conversations, something shifted. A hike through decommissioned motorway taken by the nature a decade ago became a moment of connection. A silent meditation in the woods helped participants feel part of something larger. An outdoor cinema screening sparked laughter, curiosity, and reflection. These weren’t just activities – they were invitations to belong.

One of the most powerful tools was ‘Pathbreak: a Biodiversity-Food-Governance Game’. In this simulation, participants faced real-world dilemmas – how to balance food choices, environmental impact, and governance. The game didn’t offer easy answers, but it did offer agency. The young people debated, negotiated, and made decisions together. They saw how their values shaped outcomes and how systems could be changed.

As the weeks passed, roles began to blur. Facilitators became learners, youth became leaders. Participants proposed their own ideas, initiated workshops, and in one case co-designed and delivered an entire weekend-long educational program for other young people – Youth4Biodiversity – rooted in the principles of ecological systems thinking. These activities were no longer "delivered to" them, but "led by" them. The Learning Community evolved into a space of mutual trust, experimentation, and collective purpose.

Through this journey, participants didn't just learn about biodiversity. They embodied it. They saw themselves as part of nature, not separate from it. And in doing so, they began to reshape their communities, their institutions, and their futures.

Alignment with PLANET4B Goals

This story reflects PLANET4B's core objectives:

- **Intersectionality:** The case centres on youth at the intersection of migration, age, and cultural identity.
- **Behavioural and Institutional Change:** Youth moved from disempowerment to advocacy, influencing community narratives and institutional openness.
- **Participatory and Creative Methods:** Experiential games, nature immersion, and co-creation were central to transformation.
- **Leverage Points:** Youth engagement in biodiversity became a gateway to broader systemic change.

Outcomes and Vision

The Learning Community helped youth:

- **Reframe biodiversity as a lived experience:** By immersing young people in experiential activities such as hiking, outdoor cinema, and mindfulness in nature, the Learning Community made biodiversity tangible, personal, and emotionally resonant. Youth participants no longer saw biodiversity as a distant, scientific concept, but as something connected to their everyday actions, surroundings, and values.
- **Build confidence through co-creation and ownership:** Rather than being passive recipients, youth were actively involved in shaping their learning journeys – designing activities, leading reflections, and co-facilitating sessions. This agency strengthened their self-efficacy and helped shift mindsets from individual concern to collective advocacy.
- **Develop emotional, cognitive, and social competencies:** The combination of nature-based experiences and participatory facilitation created safe, inclusive spaces where youth could process eco-anxiety, explore systems thinking, and build meaningful peer connections. These emotional and social competencies are crucial for long-term civic engagement.
- **Access opportunities and expand horizons:** The Learning Community helped **participants** access new opportunities, including the ability to apply for funding and develop projects to replicate similar biodiversity interventions in other countries. This sense of continuity and growth beyond the initial activities reflects the project's transformative impact.
- **Engage with complexity and act systemically:** Through games like the Biodiversity-Food-Governance simulation and real-world challenges during the retreat, youth learned to navigate the complexity of environmental governance

and recognise systemic barriers and enablers. This empowered them not only to act locally, but to think globally and advocate effectively.

Our **vision** is to create as many educational opportunities as possible – across the EU and globally – that mirror the transformative experience of the Learning Community. The goal is to enable young people everywhere to build a deep, personal connection with nature and to foster a readiness to act at the individual and community levels. By multiplying these micro-actions and localised interventions, we aim to nurture a shared, human approach to biodiversity – one rooted in empathy, responsibility, and collective stewardship of the planet. Through immersive, participatory learning, youth can become catalysts of systemic change, turning individual insight into a common culture of care for nature.

Lessons for Broader Application

- Immersive experiences foster deep learning and emotional connection.
- Ownership and co-creation are key to youth empowerment.
- Emotional safety and relational learning are essential for transformation.
- Structural barriers must be acknowledged and addressed to ensure inclusion.

Story of Transformative Change: Enabling intersectional nature recreation and biodiversity stewardship for urban resilience (Greater Oslo, Norway)

From Unease to Action: Transforming Outdoor Inclusion through Intersectional Stewardship in Oslo

Context and Challenge

In Oslo, Norway's most biodiverse urban region, access to nature is not equally distributed. Children and youth with disabilities often face exclusion from organised outdoor recreation, despite the city's strong tradition of *friluftsliv* (outdoor nature recreation). This exclusion reflects broader systemic issues, where intersectional barriers related to disability, age, and social status limit participation in nature-based activities.

The PLANET4B project identified this as a critical leverage point: how can outdoor recreation be reimaged to prioritise biodiversity while ensuring equitable access for all?

The Turning Point

Reidun Bolsø, who leads the Greater Oslo Recreation Council (OOF), had long recognised the need for a more inclusive approach. Yet, she felt uncertain. Her concern was not about failing broadly, but about failing subtly – using the wrong language, missing key needs, or falling short of meaningful inclusion.

A transformative moment came during a PLANET4B expert network meeting, where individuals with lived experience of disability shared stories that reframed her understanding. Rather than focusing on limitations, they emphasised possibilities. This shift in narrative, from barriers to potential, was pivotal.

Transformative Change in Action

Reidun Bolsø had spent years working in urban planning, always aware of the gaps in access to nature for people with disabilities. She knew her organisation had influence – but she also knew it lacked knowledge to make outdoor recreation truly inclusive for all individuals with disabilities. Inspired by stories of sleeping in a hammock in the forest with adaptive gear, and building an igloo, she returned to OOF with a new vision. She didn't just want to avoid mistakes – she wanted to think differently. She proposed creating a guidebook for outdoor activity leaders, not as a checklist, but as a mindset shift. Inclusion, she realised, wasn't about ticking boxes. It was about listening, adapting, and co-creating.

PLANET4B opened doors to new collaborations. OOF joined forces with the Norwegian Institute for Nature Research and other partners, engaging in cross-sector dialogues with health agencies, sports associations, and disability organisations. These conversations helped Reidun and her team move from broad ambitions to specific actions in their own organisation. They began mapping local needs, identifying geographical disparities, and exploring how universal design could be embedded in the outdoor space her organisation used as a daily base for outdoor recreation.

The transformation wasn't just institutional. It was personal. Reidun's unease gave way to curiosity. Her caution turned into confidence. She began advocating for disability inclusion in OOF's strategy and suggested inviting disability interest groups to become

members. Developing OOF's strategy is still in process, but the administration of the organisation has broadened its network and become more aware of the tools it can use to be a potential leader in inclusive recreation.

Researchers involved in the case also experienced shifts: like Reidun, they entered the project unsure of how to approach disability in outdoor settings, but through interviews, fieldwork, and shared learning, they developed a common language grounded in respect and equality. They learned to “translate” between institutional knowledge and lived experience, building trust across sectors.

Together, OOF and its partners began to reshape the narrative around nature access. Outdoor recreation was no longer just about trails and facilities – it was about belonging. It was about ensuring that every child, regardless of ability, could feel the joy of moss underfoot, the thrill of a forest breeze, the quiet power of a shared campfire. This wasn't just a change in programming – it was a change in perspective. And it started with a conversation.

Alignment with PLANET4B Goals

This story exemplifies PLANET4B's core objectives:

- **Intersectionality:** The Oslo case foregrounds how disability and age intersect with access to biodiversity and outdoor life.
- **Behavioural and Institutional Change:** Reidun's shift from uncertainty to advocacy reflects a transformation in mindset and institutional practice.
- **Participatory Methods:** The project used dialogue, fieldwork, and co-creation to build trust and shared understanding.
- **Leverage Points:** By focusing on inclusion in outdoor recreation, the case targets a key system node where small changes can yield wide-reaching impact.

Outcomes and Vision

OOF has since initiated new collaborations with disability organisations, contributed feedback to municipal mapping of outdoor areas, and begun embedding inclusive design into its strategic planning. As Reidun put it:

“I ended up thinking that OOF has the tools to make change locally and potentially nationally too. I suggested for my board leader that we include the disabled in our strategy, and I now think that we ought to recruit some from the interest group as members of our organisation.”

Lessons for Broader Application

- Cross-sector collaboration is essential for inclusive biodiversity stewardship.
- Emotional safety and trust are prerequisites for transformative learning.
- Inclusive design must be embedded from the outset, not added as an afterthought.
- Intersectional analysis helps identify who is excluded and why, enabling more just and effective interventions.

Story of Transformative Change: City food for biodiversity and inclusion (Graz, Austria)

From Soil to Solidarity: Growing Biodiversity and Belonging in Graz's Edible City

Context and Challenge

In Graz, Austria, research focused on how biodiversity loss intersects with urban inequality. While the city hosts over 30 community gardens, access to green space and healthy food remains uneven. Migrant women, single mothers, and elderly women living alone often face barriers – physical, linguistic, and symbolic – that could prevent them from participating in urban greening initiatives. Without deliberate inclusion, such projects risk reinforcing social exclusion and contributing to green gentrification.

The PLANET4B project recognised this as a critical entry point. Could biodiversity initiatives be reimagined to centre social justice, lived experience, and community agency? Could gardens become spaces not just for ecological restoration, but for collective transformation?

The Turning Point

The collective effort to build the garden was symbolically celebrated through the installation of the garden fence. It was a moment when physical work resulted in a deeper sense of belonging. Women* who had previously felt unsure of their belonging in an urban garden picked up tools, worked side by side, and declared, “This is our garden.” That simple phrase marked a shift – from participation to ownership. It was the moment the garden stopped being “only” a research site and became a brave community space for female empowerment and agency.

Transformative Change in Action

The transformation began not with tools or seeds, but with listening. Facilitators invited women* from different marginalised backgrounds to share stories of place, memory, and food. Nature walks, shared meals, and storytelling circles created a welcoming atmosphere. Slowly, trust took root.

The GAIA Gartenberg community garden emerged from this process. It was co-designed by women* with migration histories, single mothers, and retired women, alongside gardeners, artists, and researchers. Together, the women* created a place of bio-/diversity. The construction of the garden fence marked a symbolic act of collective ownership.

Learning unfolded through hands-on practice. Participants mapped pollinator paths, reflected on the handling of snails, planted culturally significant crops, and exchanged growing and food traditions. Gardening became a practice of belonging. Over time, women who had once held back due to language barriers or lack of confidence began coordinating tasks, welcoming newcomers, and even founding an association to manage the garden beyond the project's duration – becoming central agents of activities on this green space, the first Community Park of the city.

The garden became a living lab for biodiversity and inclusion. It was a place where ecological knowledge met cultural memory, where food sovereignty and social resilience grew side by side. Biodiversity was no longer abstract – it was visible in the soil, tasted in the harvest, and felt in the rhythms of community life.

Alignment with PLANET4B Goals

This story reflects PLANET4B's core objectives:

- **Intersectionality:** The project centred women* affected by overlapping inequalities of gender, migration, class, and age.
- **Behavioural and Institutional Change:** Participants moved from passive engagement to active stewardship, engaging in municipal planning and policy.
- **Participatory and Creative Methods:** Storytelling, mapping, and co-creation were used to surface hidden knowledge and foster transformation.
- **Leverage Points:** The garden became a site for testing systemic change, linking biodiversity to food justice and urban governance.

Outcomes and Vision

The GAIA Gartenberg is now more than a garden. It is a nucleus for an emerging community park, with a second garden and orchard meadow already underway. The municipal green space department has become a committed partner, signalling that the Bio-Diverse Edible City idea is becoming part of Graz's urban development strategy.

The deeper legacy lies in the lives of the women*² who now see themselves not just as gardeners, but as urban actors. As one participant put it, "Before, I thought this kind of thing was for other people. Now I know it can be ours."

Lessons for Broader Application

- Transformative change begins with people's lived experiences and opening room for agency, not just policy targets.
- Reducing barriers to participation – through translation, childcare, and flexible formats – makes engagement more inclusive.
- Valuing lived experience alongside scientific expertise unlocks meaningful co-creation.
- Diversity in the community is a strength to be celebrated, not a challenge.
- Sustaining active facilitation helps self-organisation to bloom.
- Ensuring the availability of appropriate resources is crucial for the successful initiation of pilots that drive transformative change.

² In German-speaking feminist contexts, the use of women* (with an asterisk) signals an effort to be gender-inclusive and intersectional. It explicitly opens the category beyond cis women to include those who are marginalised by patriarchal gender norms and sexism. It is a shorthand for FLINTA persons: **F**rauen (Women), **L**esbians, **I**ntersex, **N**on-binary, **T**rans persons and **A**genders.

Story of Transformative Change: Swiss attitudes towards agriculture-biodiversity (Switzerland)

From Faith to Fields: Cultivating Biodiversity through Spiritual Values in Swiss Agriculture

Context and Challenge

In Switzerland, Christianity is the dominant religion. Agriculture occupies more than a third of the national territory and plays a significant role in shaping biodiversity. While institutional and economic pressures often dominate farming decisions, personal values – especially those rooted in religion and spirituality – can also influence environmental behaviour. Yet, in European contexts, the relationship between faith and agro-biodiversity has not really been explored. The PLANET4B project identified this as a unique leverage point. Could religious and spiritual beliefs serve as a catalyst for biodiversity stewardship among farmers? And if so, how might these values be activated and communicated in ways that resonate across communities?

The Turning Point

The turning point emerged through a photo exhibition. As visitors moved through the images – each one a quiet testament to the spiritual dimensions of farming – they began to see biodiversity not just as a scientific concern, but as a moral one. Invitations followed – from churches, journalists, and community groups – signalling that the conversation had struck a chord. For many attendees, the exhibition was the first time they had considered the link between faith and biodiversity. The act of viewing, reflecting, and responding became a moment of ethical awakening. It was in this space, between image and insight, that the seeds of change were planted.

Transformative Change in Action

The transformation began with a question: how do Swiss farmers connect their spiritual beliefs to the way they care for the land? A researcher conducted interviews with Swiss farmers exploring their thoughts and perspectives about the topic. The researcher invited farmers to share photos or visually demonstrate how their beliefs influenced their farming behaviour and eventually biodiversity. Each image or short video captured a moment where faith met farming – a driving force behind the selection of a specific type of tractor that would eliminate the need for pesticide use, treating farm animals with love and care, and viewing a landscape as sacred and as a gift from God to be cherished rather than destroyed.

These photos became the heart of a travelling exhibition, shown in churches, community centres, and public spaces. Visitors were invited not just to observe, but to reflect. Notes were posted on public boards, conversations sparked, and new connections formed. A message from a former president of a farmers' association, sent directly to the lead researcher, expressed how vital this topic was for the future of agriculture. A church invited the researcher to present the study during their annual thanksgiving event. Another church was inspired by the exhibition and organised an inter-religious discussion inviting representative speakers from different religions to present on the topic of biodiversity and religion alongside the photo exhibition. The exhibitions were more than displays – they were interventions. Surveys revealed that some attendees had never considered the link between biodiversity and spiritual belief. After viewing the exhibition, they saw that connection clearly. For some, it was a new revelation. For others, it was a validation of long-held but rarely voiced convictions.

The project also reached academic and media audiences. A published article on the theoretical links between religion and environmental behaviour received dozens of reads from countries beyond Europe. A second article, based on farmer interviews, is in preparation. A podcast, news articles, and community media helped extend the conversation, while PLANET4B's digital platforms amplified the message.

Yet the transformation was not without tension. Some participants expressed concern that linking biodiversity too closely with religion might alienate those with different beliefs or none at all. Others pointed to the diminishing role of religious institutions in public life. Economic pressures also surfaced as a major barrier – farmers often lacked the time, resources, or financial stability to act on their spiritual values.

Still, the project planted seeds. It opened space for dialogue, for ethical reflection, and for imagining new pathways where faith and ecology walk hand-in-hand.

Alignment with PLANET4B Goals

This story reflects PLANET4B's core objectives:

- **Intersectionality:** It explores how religious and spiritual identity intersects with farming behaviour and environmental ethics.
- **Behavioural and Institutional Change:** The project targets mindset-level transformation, aiming to shift values that underpin biodiversity decisions.
- **Participatory and Creative Methods:** Photo exhibitions, a visionary vignette during interviews, and community engagement served as tools for reflection and dialogue.
- **Leverage Points:** By focusing on values and belief systems, the project engages one of the deepest levels of change identified in leverage point theory.

Outcomes and Vision

The vision is of faith communities embracing environmental care as a spiritual duty. Churches, mosques, temples, and other spaces of worship become hubs for biodiversity awareness and action. Farmers see their land not just as a resource, but as a sacred trust. Spiritual groups organise forest walks, children's gardens, and seasonal rituals that honour the Earth.

This transformation extends beyond religion. It invites all communities to reflect ethically on their relationship with nature, regardless of religious affiliation.

Lessons for Broader Application

- Value-based framing can deepen engagement with biodiversity.
- Creative methods like photo exhibitions can trigger reflection and dialogue both for those who contribute to their creation and those who view them.
- Faith communities are powerful but underutilised allies in environmental work.
- Economic pressures must be acknowledged and addressed to enable value-driven behaviour.
- Inclusivity requires careful framing to avoid alienating non-religious or differently religious audiences.

3.2 Six sector-based TCSs: Transformations across sectors

The TCSs of six sector-based cases show how biodiversity challenges are deeply embedded in globalised systems of trade, finance, fashion, agriculture and education, and how change requires rethinking institutional logics and sectoral norms. They underscore that systemic change extends beyond technical fixes, instead pointing to leverage points in values, narratives, and institutional frameworks. As they suggest, biodiversity-positive futures depend on aligning equity, cultural change, and governance innovation across entire sectors.

Story of Transformative Change: Sustainable investment behaviour (Global – EU – Norway)

Uncovering Psychological Barriers to Biodiversity-Positive Finance

Context and Challenge

In recent years, biodiversity has gained visibility in global sustainability discourse, yet, within the world of finance, it remains a marginal concern. ESG investing – which aims to integrate environmental, social, and governance factors into financial decision-making – has made strides in climate and social equity but continues to overlook biodiversity. The reasons are not only structural or data-related – they are psychological.

This case study explored how cognitive biases – the mental shortcuts investors use to make decisions under uncertainty – subtly but powerfully shape investment behaviour. These biases, such as loss aversion, status quo bias, and the tendency to rely on heuristics, often lead investors to undervalue biodiversity risks and opportunities. Despite the growing urgency of nature loss, biodiversity-positive companies struggle to attract capital. The research revealed a striking gap: the role of cognitive biases in ESG investing, especially regarding biodiversity, is almost entirely absent from the literature and from mainstream financial practice.

Vision for Transformation

In the future we imagined, biodiversity is no longer a footnote in financial analysis – it is a central concern. Investors are trained not only in data interpretation but in self-awareness. They learn to recognise their own behavioural blind spots and to question the assumptions that guide their decisions. Investment teams routinely discuss nature-related risks, and biodiversity stewardship becomes a shared value across institutions.

Decision-support tools evolve to reflect this shift. They incorporate locally sourced biodiversity data, reducing uncertainty and making it easier for investors to move beyond gut feeling and simplistic metrics. Algorithms and scenario models help mitigate bias, offering more nuanced insights into the ecological impact of investment choices.

But the transformation is not just technical. It is cultural. It requires a rethinking of what it means to be a responsible investor – not just someone who avoids harm, but someone who actively contributes to ecological regeneration. Investors begin to see themselves not as placeless actors in a global market, but as stewards of the places their capital touches. This shift in mindset – from extraction to care; abstraction to connection – is the deepest leverage point of all.

Leverage Points and Pathways

The research laid the groundwork for future change by identifying key leverage points:

- The absence of biodiversity in ESG frameworks is not just a data gap – it's a cognitive blind spot. Addressing this requires integrating behavioural science into financial education and tool design.
- Literature review and stakeholder engagement revealed opportunities to develop decision-support systems that reduce reliance on heuristics and promote biodiversity-conscious investing.
- A forthcoming book chapter on cognitive biases in ESG investing may serve as a pedagogical tool, influencing how future financial professionals are trained.

While the case did not produce immediate behavioural shifts, it contributes to the practical sphere of transformation – offering insights that can inform future interventions, curricula, and financial innovation.

Barriers and Enablers

The path to transformation is shaped by both resistance and possibility.

Among the barriers are entrenched habits of thought, the invisibility of biodiversity in financial metrics, and the lack of investor training in behavioural awareness.

There are **enablers** too: the rise of nature-related financial disclosures, growing interest in behavioural finance, and the potential to embed these insights into education and professional development.

Story of Transformative Change: Trade and global value chains (Brazil – EU)

Reimagining Trade for Biodiversity and Justice

Context and Challenge

The global trade system is deeply entangled with biodiversity loss and environmental injustice. In the case of soy and beef supply chains between Brazil and the Netherlands, the impacts are stark. Dutch livestock farming relies heavily on imported soy for animal feed, creating a land footprint of 2.7 million hectares annually – much of it in Brazil's Cerrado and Amazon biomes. These imports are linked to deforestation, nitrogen pollution, and the displacement of Indigenous peoples and local communities.

Meanwhile, pesticides banned in the EU continue to be exported to Brazil, exacerbating ecological degradation and health risks. Despite emerging regulations like the EU Regulation on Deforestation-Free Products (EUDR) and the Corporate Sustainability Due Diligence Directive (CS3D), the trade system remains largely blind to the intersectional dimensions of environmental harm – failing to account for the lived experiences of forest peoples, small-scale farmers, and biodiversity itself.

Vision for Transformation

In the future we envision, trade is no longer a mechanism for extraction and inequality, but a tool for regeneration and justice. Supply chains are transparent and traceable, with companies openly sharing data on the origins of commodities. Forest peoples and small-scale producers are recognised not as obstacles to development, but as stewards of socio-biodiversity value chains – agroecology, bioeconomy, and cultural heritage become sources of livelihoods and instruments to promote social-ecological justice.

The preservation of native vegetation and biodiversity is embedded in trade agreements, and the rights of Indigenous Peoples and Local Communities (IPLCs) are safeguarded. EU agricultural policy shifts away from subsidising large-scale agribusiness and toward supporting agroecological transitions. Pesticide exports that harm ecosystems and communities are banned, and historical narratives about the impacts of large-scale soy and beef production are brought into public discourse through storytelling, media, and education.

Finance flows are redirected: banks and agribusiness firms are held accountable for deforestation-linked investments, and the food system begins to reduce its reliance on animal protein. Trade becomes a space of co-creation, where biodiversity and human dignity are prioritised together.

Leverage Points and Pathways

The case identified nine key changes needed to transform the trade system:

1. Public sharing of traceability data of soy and beef origins.
2. Valuing forest-based peoples' bioeconomies as alternatives to monocrops.
3. Embedding biodiversity and human rights in trade agreements.
4. Reforming EU agricultural subsidies to support agroecology.
5. Ending pesticide exports that harm biodiversity and human health.
6. Raising public awareness through storytelling and media.
7. Tailoring biodiversity narratives to diverse audiences.

8. Banning finance linked to deforestation.
9. Reducing animal protein in European diets.

These changes reflect both shallow and deep leverage points – from policy parameters to paradigm shifts. They were developed through transdisciplinary workshops, stakeholder engagement, and collaborative research, including audiovisual productions and policy briefs.

Barriers and Enablers

Barriers include entrenched economic interests of powerful stakeholders (banks, large trading companies, large farmers), lack of transparency in supply chains, and limited public awareness of biodiversity impacts. The dominance of industrial agriculture and the inertia of trade policy also pose significant challenges.

Enablers include emerging EU regulations, growing civil society mobilisation, and the creative use of media and storytelling to shift public narratives. The involvement of Indigenous populations and grassroots movements offers powerful momentum for change.

Story of Transformative Change: Agro-Biodiversity Management (Hungary)

The Way of the Seeds: Reclaiming Agrobiodiversity Through Care and Connection

Context and Challenge

In the dominant agricultural paradigm, seeds are treated as mere inputs – tools for maximising yield in industrial systems. This production-oriented logic prioritises uniformity, mechanisation, and volume, often at the expense of flavour, nutritional value, cultural heritage, and ecological resilience. The legal frameworks and agricultural policy support schemes governing the seed system reinforce this model, restricting the circulation of diverse vegetable varieties, eventually constraining on-farm agro-biodiversity conservation.

Such restrictions ignore a fundamental truth: biodiversity in agriculture is not preserved in vaults or databases alone. It lives through use – through the hands of gardeners, farmers, and communities who grow, exchange, and adapt seeds to local conditions. When these practices are suppressed, we lose not only genetic diversity but also the cultural and gastronomic richness that sustains resilient food systems.

Vision for Transformation

In the future envisioned by those interviewed, seeds are no longer commodities – they are connectors. Open-pollinated vegetable seeds circulate freely among amateur gardeners, small-scale farmers, and community-supported agriculture (CSA) networks. Seed swaps become vibrant social events, hosted in libraries, community centres, and even ethnographic museums. These gatherings are not just about exchange – they are about storytelling, experimentation, and shared stewardship. Community seed banks flourish in diverse forms, from local farms to civil society hubs. They are linked in a decentralised, self-organising network that mirrors the diversity of the seeds themselves. Knowledge flows in all directions – between generations, between amateurs and professionals, between grassroots initiatives and national institutions. The national gene bank and research institutions collaborate with community networks, enriching each other through mutual learning.

Small-scale seed companies play a vital role, bridging community innovation and market access. They ensure that high-quality, diverse seeds are available to those who need them, while earning fair livelihoods. The system is resilient: if one node falters, others step in to support it. No single actor dominates. Power is distributed, and cooperation replaces competition as the guiding economic logic.

Laws and regulations protect this ecosystem of care. They safeguard the rights of farmers, gardeners, and communities to access and share seeds and knowledge. Monopolistic interests – whether from the state, market, or science – are held in check. The ethos of reciprocity, already practiced by attentive gardeners, becomes the foundation of a new agricultural paradigm.

Leverage Points and Pathways

The seeds of this transformation already exist. Across Hungary, seed swaps are multiplying. Courses on ecological gardening and self-sufficiency are spreading. Civil initiatives are connecting, forming a resilient network of practice and learning. These

grassroots movements embody the care- and connection-based paradigm that could replace the dominant production model.

To nurture this transformation, policy must evolve. The ongoing reform of EU seed legislation – the “new seed law” – is a critical leverage point. If small-scale initiatives are regulated with the same rigidity as multinational agribusinesses, the system will stagnate. But if the law recognises the unique role of community-based conservation, it can become a catalyst for change.

Barriers and Enablers

Barriers include restrictive seed laws, market concentration, and the undervaluing of non-commercial seed systems. The dominance of industrial agriculture and the bureaucratisation of grassroots initiatives threaten the vitality of agro-biodiversity.

Enablers include existing community seed networks, growing public interest in ecological gardening, and the potential for policy reform. The collaborative spirit of gardeners, farmers, researchers, and artists offers a powerful foundation for systemic change.

Story of Transformative Change: Environmental awareness raising in education (Hungary)

Growing Minds: Reconnecting Children with Nature Through School Gardens

Context and Challenge

Across Europe, modern world children are growing up increasingly disconnected from nature, which has consequences at every level. Personally, it contributes to declining mental and physical health, a lack of ecological awareness, and diminished responsibility for the environment. Practically, it weakens care and stewardship, as children fail to see their role in protecting biodiversity. Politically, nature is often treated as a resource to be exploited, rather than a partner in sustaining life.

Environmental education has the potential to bridge this gap, but it is often confined to classrooms and taught in isolation from lived experience. In Hungary, systemic barriers – including centralised curricula, overburdened teachers, and limited institutional support – prevent experiential learning from becoming mainstream. School gardens, which offer hands-on engagement with biodiversity, remain underutilised despite their transformative potential.

Vision for Transformation

In the future we imagine, every child grows up with a deep, experiential connection to nature. School gardens are not extracurricular novelties but central components of education. They are spaces where students learn not only biology, but empathy, cooperation, and resilience. Subjects are taught holistically, emphasising the interconnectedness of all living beings. Teachers are empowered to integrate outdoor learning across disciplines, and policymakers recognise experiential education as essential to ecological literacy and stewardship.

These gardens become hubs of community engagement. Parents, local farmers, and conservationists collaborate with schools, fostering intergenerational learning and sustainable food practices. Municipalities and NGOs provide resources and support, ensuring gardens flourish and expand. The result is a generation of students who not only understand biodiversity but feel responsible for it – who see themselves as part of nature, not separate from it.

Leverage Points and Pathways

The transformation begins with small but powerful shifts. In one Hungarian school, a neglected green space was turned into a thriving garden through participatory action research. A dedicated “lighthouse” teacher led the initiative, working with researchers and students to co-create the space. As the garden grew, so did ownership, values, and institutional change. Arts-based methods and reflexive learning deepened students’ connection to nature, fostering long-term behavioural shifts.

This model offers a pathway for broader change. Peer-learning networks, such as the Hungarian Foundation for School Gardens, help teachers share best practices. The integration of biodiversity in the curricula, aligned with national standards, enable creativity and hands-on learning. Participatory projects allow students to shape their environments, cultivating agency and ecological stewardship.

Barriers and Enablers

Barriers include rigid educational structures, lack of funding, and limited recognition of experiential learning in policy. Teachers often lack time, support, and training to implement nature-based education. Broader political dynamics may also constrain innovation.

Enablers include passionate educators, supportive school leadership, and growing networks of practitioners. Community involvement, NGO partnerships, and municipal support provide resources and legitimacy. The gardens themselves – as living, evolving spaces – become catalysts for change, demonstrating the power of learning by doing.

Story of Transformative Change: From "egosystem to ecosystem" (Italy)

What Should We Wear on a Planet in Peril? Rethinking Fashion for Biodiversity

Context and Challenge

The fashion industry is one of the most resource-intensive and environmentally damaging sectors in the world. From cotton fields to textile mills, from fast fashion outlets to landfills, the industry's global supply chains are deeply implicated in biodiversity loss. Land-use change, pollution, and climate emissions are driven by the relentless pursuit of cheap materials, rapid production cycles, and ever-growing consumption.

Fashion's impact is not only environmental but social. The sector relies on low-cost labour, often in precarious conditions, and perpetuates inequalities between the Global North and South. Despite its cultural influence and economic power, fashion has largely ignored its role in the biodiversity crisis. Academic literature and EU policy have only recently begun to address this gap.

Vision for Transformation

In the future we envision, fashion becomes a force for ecological regeneration and social justice. Biodiversity is no longer an afterthought, but a guiding principle. The industry shifts from a linear "take-make-waste" model to one rooted in circularity, sufficiency, and care.

Garments are designed to last. Repair services are accessible, and skills in mending and maintenance are widely shared. The flow of new products slows, and marketing no longer fuels compulsive consumption. Instead, people value what they already own, and fashion becomes a medium for expression, not excess.

Raw materials are cultivated through agroecological practices that regenerate ecosystems. Fossil fuel-based synthetics are phased out, and water and chemical use is tightly regulated. Small and local enterprises thrive, building meaningful relationships with communities and traditions. Workers enjoy safe, fair conditions, and trade unions help rebalance power in the sector.

Governance shifts from voluntary pledges to binding regulations. Brands, producers, and brokers are held accountable for their impacts across the supply chain. Public action plans support collaboration across institutions, levels, and scales – from grassroots movements to international frameworks. Fashion becomes a space where biodiversity, dignity, and creativity coexist.

Leverage Points and Pathways

The research identified twelve key messages for transforming fashion:

- Make biodiversity a priority across the sector.
- Reduce production and consumption volumes.
- Transition to agroecological farming for raw materials.
- Shift away from virgin and fossil-based materials.
- Support circularity through repair, reuse, and recycling.
- Regulate water and chemical use.
- Promote business models based on sufficiency, quality and regeneration.

- Ensure fair labour conditions and social protection.
- Move from voluntary to legally binding governance.
- Deepen understanding of fashion–biodiversity interdependencies.
- Improve transparency and accountability in supply chains.
- Strengthen collaboration across actors and institutions.

These messages emerged from interviews, document analysis, and visioning workshops with key stakeholders, including small and medium-sized companies already pioneering sustainable practices.

Barriers and Enablers

Barriers include entrenched business models that prioritise short-term economic gains over sustainability, lack of regulation, and consumer habits shaped by decades of marketing. The invisibility of biodiversity in fashion discourse, the fragmentation and the strong power inequalities within the supply chains also hinder change.

Enablers include growing awareness of planetary boundaries, the rise of sustainability-focused enterprises, and increasing pressure for regulatory reform. Cultural shifts toward justice, sufficiency and care – supported by education, activism, and policy – offer fertile ground for transformation.

Story of Transformative Change: Agriculture and migration (EU)

Rooted in Diversity: Rethinking Agricultural Labour for Biodiversity and Justice

Context and Challenge

Agriculture is both a driver of biodiversity loss and a sector deeply dependent on it. Intensive farming practices – monocultures, mechanisation, and chemical inputs – degrade ecosystems while relying on the services those ecosystems provide. Transforming farming landscapes to support biodiversity is essential, but such transformation is labour- and knowledge-intensive.

In Europe, much of this labour is performed by seasonal migrant workers, often under precarious conditions. Tasks such as manual weeding, crop diversification, and maintaining field margins require skill, time, and care, yet the system is structured around short-term contracts, low wages, and limited rights. Farmers face pressure to produce at world market prices, leaving little room for ecological or social innovation.

Biodiversity-friendly farming cannot be achieved without addressing the labour systems that underpin it. Social and environmental sustainability are inseparable. To transform agriculture, we must also transform how we value and organise agricultural work and workers.

Vision for Transformation

In the future we imagine, farms are diverse, locally adapted, and rooted in both ecological responsibility and social justice. Biodiversity is not an add-on but is integral to farm management. Crops flourish alongside wild flora and fauna, and agricultural landscapes become mosaics of productivity and habitat.

Farm workers are respected as skilled professionals. They are employed on fair terms, with regulated shifts, decent wages, and opportunities for decision-making. Their knowledge – accumulated through years of experience – is recognised and nurtured. Training programmes support both ecological literacy and workers' rights, enabling long-term relationships and career development.

Mechanisation and digital tools are used thoughtfully, not to displace workers or accelerate exploitation, but to support biodiversity and reduce physical strain. Farmers have the financial and organisational freedom to prioritise sustainability, supported by consumers who value quality and by policies that reward ecological stewardship.

These farms are socially, environmentally, and culturally resilient – better equipped to adapt to climate change and global crises, and offering meaningful work in vibrant rural communities.

Leverage Points and Pathways

The transformation begins with recognising the value of diversity in crops, in labour, and in knowledge. Direct selling channels allow farmers to retain more value, enabling better wages and more varied tasks. This diversity makes farms more attractive to workers and more resilient to market pressures.

Knowledge transmission between farmers and migrant workers is a key leverage point. Many workers bring expertise from their home countries and gain new skills abroad.

Supporting this exchange – through training, recognition, and long-term contracts – strengthens both biodiversity and social cohesion.

Policy also plays a crucial role. Subsidy schemes that link biodiversity practices to labour standards, such as recent reforms in the EU's Common Agricultural Policy, offer a model for integrating environmental and social goals. A coherent European framework could further support fair labour conditions and robust rights protections.

Barriers and Enablers

Barriers include financial constraints, consumer price sensitivity, and structural dependence on low-wage migrant labour. The seasonal nature of farming and the normalisation of poor working conditions make change difficult. There is also a shortage of specialist staff and limited pathways for workers to advance.

Enablers include direct marketing models, growing interest in agroecology, and emerging policy reforms. Farmers who prioritise diversity and fair conditions are already demonstrating that another way is possible. Their success stories – built on good food, good work, and good relationships – offer a roadmap for transformation.

4 Points of transformative change

Our Transformative Change Stories reveal that transformative change is not driven by single interventions but by a set of interlinked elements that shift how people, institutions, and systems relate to nature and biodiversity-relevant decisions. Transformative biodiversity governance depends on systemic shifts in participation, values, and justice, rather than isolated interventions (Hutchinson et al., 2025).

Across the very different contexts and scales of our case studies, the cases highlight common points where change gains momentum. These include developing **creative safe spaces** that dismantle barriers of exclusion and allow trust to grow; **fostering knowledge co-creation and sharing** through experimentation, dialogue, and recognition of diverse expertise; **building agency** so that participants, particularly marginalised and vulnerable groups, are empowered to act as stewards and actors of change; forming **partnerships instead of separation** that bridge cultural divides, sustain living networks, and connect sectors; and re-imagining **regulations for social and environmental justice** that enable circularity, sufficiency, and bottom-up initiatives.

These five elements are synthesised in **Figure 1**, which visualises how transformation unfolds across the personal, political, and practical spheres, with agency running through all levels as the key outcome. In the following sub-sections, the elements are illustrated with concrete examples from the 11 case studies. Each subsection introduces one element, explains its key dimensions, and shows how it unfolded in practice. The analysis highlights not only what supported transformative change in specific contexts, but also which lessons can be learned across places and sectors.

Conceptually, this pathway aligns with Vogel & O'Brien's (2022) argument that genuine transformation necessitates crossing or transcending entrenched boundaries through transdisciplinary, transgressive, and transcendent approaches. This is precisely what our case studies put into practice. It also aligns with O'Brien et al.'s (2023) notion of **fractal agency** and the **three spheres of transformation** (personal, political, practical): when everyday actions are grounded in universal values like care, dignity, and fairness, they repeat as self-similar patterns that link bottom-up initiatives to enabling institutions and rules. Our cases show the same scaling dynamic – from gardens, classrooms, and camps to governance and regulatory change.

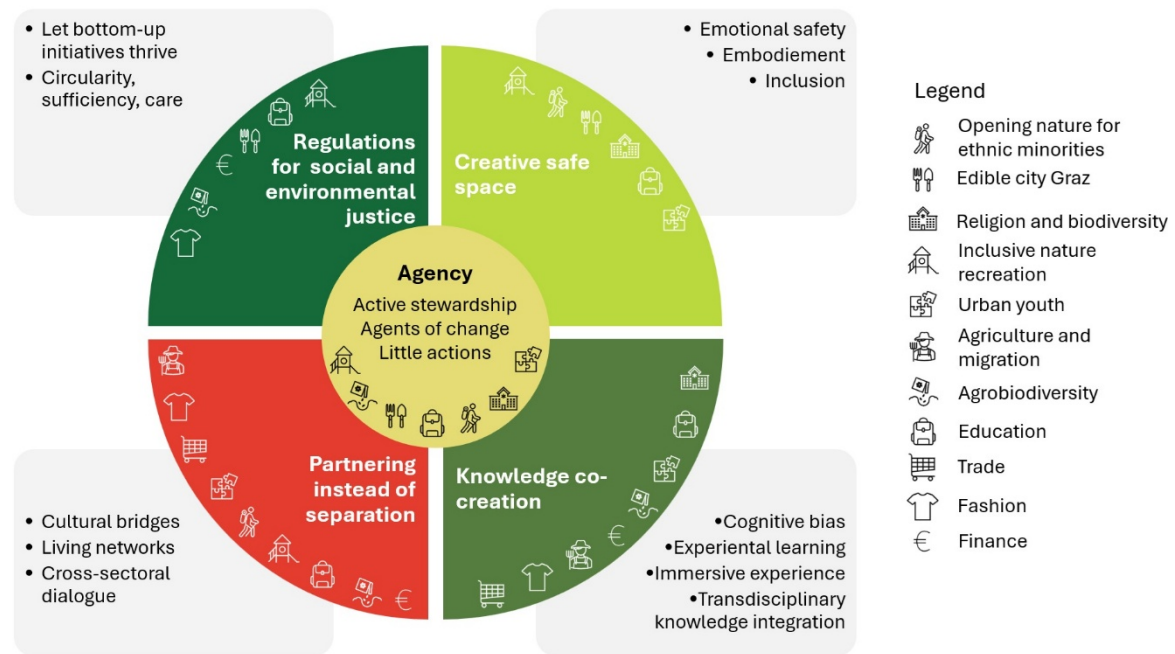


Figure 1. Core topics connecting the 11 Transformative Change Stories (own elaboration).

4.1 Creative safe spaces

Across the Transformative Change Stories, “creative safe spaces” emerged as crucial for enabling biodiversity transformations. They offered contexts in which barriers to inclusion could be dismantled, people could encounter biodiversity through embodied practice and experiential learning rather than abstract discourse, and emotional safety allowed participants to share vulnerabilities, build trust, and explore new ways of relating to each other and to nature. These creative safe spaces were not add-ons; they were deliberately designed to address our specific target groups. Such spaces addressed multiple barriers at once: structural inequalities, a lack of cultural recognition, and the absence of supportive settings where participants could openly exchange and experiment without fear of being judged or failing. In sustainability transitions research, similar settings are described as “protected space”, e.g. in the context of Living Labs or real-world laboratories, which create the legitimacy and security needed for experimentation, reflexivity, and co-learning (Schäpke et al. 2018). They also catalyse change across the “three spheres of transformation” – personal, political, and practical – by nurturing shifts in values, identities, and relationships that can propagate into institutions and everyday practices (O’Brien et al., 2023). From this perspective, creative safe spaces help “scale” transformation not only through technologies or policies, but through values and relationships that exhibit fractal patterns across levels (ibid). At the same time, creative safe spaces are not neutral: they can surface trade-offs, vulnerabilities, and unintended effects that accompany transformational processes. Making these tensions discussable is part of their value (Iniasta-Arandia & Ravera, 2025). By offering contexts of safety, participants could share experiences of exclusion, reclaim agency, co-create, and establish stewardship. They also reflect insights from feminist and intersectional research, which emphasise that inclusion necessitates addressing both structural inequalities and the emotional dimensions of participation (Crenshaw, 1991; hooks, 1994; Kaijser & Kronsell, 2014). Furthermore, they created

embodied encounters with biodiversity and enabled sensitive conversations that reshaped how communities related to each other and to nature. Taken together, our cases show that creative safe spaces nurtured belonging, confidence, and agency. They also operate as “everyday” arenas where plural knowledges and emotions become visible and politically relevant to transformation (Iniesta-Arandia & Ravera, 2025). This aligns with O’Brien’s emphasis on the personal sphere (mindsets, meanings, emotions) as a critical and often overlooked leverage for systemic change (Leichenko & O’Brien, 2019).

Inclusion

Removing barriers to inclusion was a central function of creative safe spaces, yet the strategies varied according to context and target group. In Graz, for example, the emphasis was on lowering practical thresholds through translation, childcare, and flexible participation formats. Here, the act of co-creating a garden from scratch transformed access into ownership, enabling women to take visible roles in shaping urban green spaces and to participate in urban governance.

In Oslo, the key challenge was not linguistic, or physical but socio-economic and cultural exclusion linked to disability. Adaptive gear and infrastructure addressed access needs, while reframing children with disabilities as active participants and co-creators of nature experiences instead of passive recipients of care. This shift was particularly important for embedding inclusion into professional and institutional practices.

The UK case highlighted structural racism and cultural exclusion as core barriers. For Black, Asian and ethnic minority communities, the rural countryside is often experienced as unsafe or alienating. Inclusion therefore meant more than physical access, but it required safe spaces for sharing experiences of exclusion and the legitimisation of diverse cultural relationships with nature. The focus lay on recognition and representation, demonstrating that belonging in nature is inseparable from cultural visibility.

In the Urban Youth case of Germany, the barriers were shaped by conventional education and decision-making structures, which often feel hierarchical or inaccessible. Creative, playful, and embodied methods lowered barriers of expertise and language, encouraging young people to express themselves and to see biodiversity as relevant to their lives.

Collectively the TCSs reveal that inclusion is multifaceted: practical, physical, cultural, and symbolic. Each context required tailored strategies, but across all, removing barriers was the first step for marginalised groups to engage and become confident actors. Moreover, addressing inclusion requires not only lowering thresholds but also embedding diverse values and lived experiences into governance processes (de Castro et al., 2025).

Embodiment

Embodiment was a second key feature. Biodiversity became tangible and part of everyday practice. Gardening, barefoot walks, or using adaptive gear in outdoor settings made ecological knowledge felt and lived. Such embodied engagement built confidence and allowed participants to see themselves as agents of change rather than

bystanders in biodiversity debates. As Donna Haraway (2008) points out, embodiment is not an individual condition, but rather it emerges through relationships with other beings and environments, making biodiversity a lived, multispecies experience. Attending to inclusion across the three spheres helps ensure that changes in practices and policies are grounded in shifts in personal recognition, meaning, and identity, ultimately supporting a durable transformation (O'Brien et al., 2023).

In the UK case, for example, embodiment took shape through collective walks in the countryside. For Black, Asian and ethnic minority communities, physical presence in landscapes often marked by exclusion became an act of reclamation. Intergenerational walking and storytelling created unique experiences, affirming cultural identity while establishing new relationships with nature. Here, embodiment bridged personal memory and collective recognition, turning exclusion into connecting and belonging.

In Graz, embodiment unfolded through collective gardening. Building beds, planting crops, and handling the “wild nature” surrounding their garden connected the women* with biodiversity in everyday acts of care. These experiences were extended through the sharing of food: cooking, tasting, and exchanging recipes made biodiversity tangible.

The Hungarian school garden case showed how working with soil, seeds, and plants created embodied pathways for learning. Gardening connected children's physical activity with ecological knowledge, while also fostering health, life skills and teamwork. Handling plants and producing food turned biodiversity education into a multisensory and lived experience.

These examples show that embodiment is key to transformative change. Creative safe spaces, supported by physical, sensory, and emotional encounters with nature, make biodiversity meaningful and authentic. Through embodied practices, participants experienced themselves as part of a shared living world – reconnecting bonds to their human and non-human environment.

Emotional safety

Emotional safety was a crucial dimension of creative safe spaces, providing the trust and openness needed for participants to express vulnerabilities, share personal experiences, and engage in dialogue and transformative actions. Without a sense of security, especially marginalised groups often remain silent, particularly when exclusion and discrimination have shaped their relationship to nature. Emotional safety was fostered through sensitive facilitation, collective rituals, storytelling, and the recognition of lived experiences as valuable sources of knowledge. While expressed differently in each context, emotional safety consistently turned participation from hesitant engagement into confident sharing and co-creation. Emotional safety legitimises care, empathy, and imagination as drivers of change in the personal sphere, which can unlock new collective choices in the political and practical spheres (O'Brien et al., 2023). This resonates also with Vogel & O'Brien's (2022) call to expand “circles of care” and cultivate supportive communities of practice. They emphasise that transformation requires spaces where emotional dimensions, trust, and mutual support are recognised as central to sustained engagement.

In Switzerland, for example, emotional safety was essential for engaging farmers and communities in discussions about the links between faith and biodiversity. Farmers were invited to share personal photos that reflected how their spirituality connected with everyday agricultural practices. These images became part of a travelling exhibition shown in churches and community spaces, where visitors could reflect, write comments, and engage in open dialogue. For many, it was the first time that faith and environmental care were publicly connected, a process that required safe conditions to voice intimate beliefs.

In Hungary, school gardens offered emotional safety through alternative pedagogical settings. For many children, classrooms feel hierarchical and disconnected from nature, but the school gardens became spaces where they could experiment, make mistakes, and learn without fear of failure. Teachers and researchers used arts-based and participatory methods to build trust, encouraging pupils to share reflections and emotions as part of the learning process. The garden setting allowed children to express themselves freely, to experiment and to experience care, cooperation, and responsibility in a supportive environment.

In Graz, the women* established their own rules on how to (inter)act in their garden, supported by sensitive facilitation that encouraged openness and respect. Emotional safety was nurtured. Storytelling and working together in a way which granted room for everybody to contribute whatever they could, deepened trust and a sense of belonging. Through the stability of the group and the continuity of weekly meetings emotional bonds were further strengthened.

In the UK case emotional safety was indispensable for countering racialised exclusion in access to nature. Participants shared experiences of alienation and insecurity in rural spaces. Storytelling and WhatsApp exchanges provided protected contexts where such vulnerabilities could be voiced and acknowledged. This recognition created a basis for affirming cultural identities and enabled participants to reclaim a sense of belonging in landscapes.

The TCSs demonstrate that emotional safety can be grounded in continuity, recognition, cultural affirmation, play, pedagogy, or spirituality. It allows participants to speak, to learn, to reflect on vulnerabilities, and to discuss deeply held beliefs. Overall, emotional safety enabled participants to process tensions productively and to remain engaged despite uncertainty, which is an essential condition in non-linear, contested transformations (Iniesta-Arandia & Ravera, 2025). This also links with broader debates in transformation literature on the importance of creating “safe enough spaces” where tensions can be explored without undermining participation, enabling iterative cycles of experimentation and learning (Pereira et al., 2018).

4.2 Knowledge co-creation and sharing

Knowledge co-creation and sharing were central elements for transformative change across the TCSs, ensuring that diverse forms of expertise, including practical, cultural, and situated, were considered. Rather than treating knowledge as something transferred from experts to participants, the cases were built on mutual learning, iterative experimentation, and recognition of different ways of knowing. Four aspects stood out in this context: transdisciplinary knowledge integration, addressing cognitive

biases, creating space for experiential learning and play, and fostering immersive experiences that reshape how biodiversity is understood and valued. This approach reflects a growing consensus in transdisciplinary sustainability research that knowledge co-production and the integration of diverse epistemologies are essential for transformative change (Norström et al., 2020).

Transdisciplinary knowledge integration

The dimension of ‘transdisciplinary knowledge integration’ highlights the integration of different knowledge systems across disciplines, sectors, and lived experiences (Klein, 2004; Lang et al. 2012). Transformative change requires bridging scientific expertise with practical know-how, cultural traditions, and everyday practices. By creating spaces where diverse actors could reflect and collaborate, the cases demonstrate that new insights and solutions emerge at the intersections of knowledge domains. This integration not only broadens the scope of biodiversity debates but also legitimises perspectives that are often undervalued, from artisanal practices to migrant labour experience. Plural epistemologies that integrate scientific, Indigenous, and local knowledge systems are essential for legitimacy and inclusivity in sustainability transformations, as they can open pathways that are both context-sensitive and socially just (de Castro et al., 2025). It also helps to surface potential trade-offs and unintended consequences early, enabling more reflexive pathway design (Iniesta-Arandia & Ravera, 2025)

In the fashion case, for example, knowledge co-creation is centred on connecting stakeholders across a fragmented global sector. Visioning workshops with small and medium-sized enterprises, researchers, and activists created space to articulate interdependencies between fashion and biodiversity. Through dialogue, participants identified leverage points such as circularity, sufficiency, and fair labour conditions, which are issues that are rarely addressed together in conventional debates. By combining scientific insights with practitioners’ experience of sustainable production, the case produced shared knowledge that redefined fashion not only as an industry but as a site of ecological and social responsibility.

In the trade case, knowledge co-creation emerged through transdisciplinary workshops that brought together researchers, representatives from civil society, Indigenous leaders, and policy actors. These dialogues exposed how dominant EU framings of obscure deforestation, pesticide use, and the displacement of local communities in Brazil. By integrating perspectives from Indigenous peoples and grassroots organisations, the project challenged extractivist narratives and revealed socio-biodiversity value chains as viable alternatives.

In the case of migrant agricultural workers, knowledge co-creation involved recognising the voices of seasonal migrant workers not just as labourers but as holders of practical expertise. Interviews and participatory research highlighted how workers’ skills in tasks such as weeding, diversification, or maintaining field margins are essential for biodiversity-friendly farming. Supporting knowledge transmission between farmers and migrant workers is a key leverage point, because workers’ accumulated experience might represent a valuable contribution to sustaining biodiversity-friendly farming practices.

Cognitive biases

Transformative change requires challenging entrenched assumptions and mental shortcuts that hinder biodiversity-positive decisions. The TCSs show that co-creation often starts with unlearning and questioning ingrained assumptions. Confronting these systemic blind spots in workshops and policy dialogues opened space for alternative ways of framing biodiversity challenges. Addressing such blind spots parallels findings in behavioural sustainability research, which highlight that cognitive frames and dominant narratives can reinforce lock-ins and path dependencies in socio-ecological systems (Feola, 2015). Hutchinson et al. (2025) highlight how biases are reinforced by anthropocentric and economic logics, and argue that transformative governance must reframe values accordingly.

The finance case, for example, revealed how investors systematically undervalue biodiversity due to cognitive biases such as status quo bias or loss aversion. By naming and analysing these biases, researchers opened a new field of awareness, encouraging financial actors to reflect on their own decision-making processes. Reflexive workshops enabled participants to see how their assumptions filter what counts as „values“. This shift reframed biodiversity not as a missing dataset, but as a neglected dimension of perception and judgment, pointing to the need for both behavioural and structural change.

In the trade case, dialogue with Indigenous communities revealed the EU-centric extractivist framings of supply chains. The case showed how dominant narratives in global commodity flows, for example, seeing soy and beef as “necessary imports”, obscured deforestation, the displacement of Indigenous peoples, and biodiversity loss. As the TCSs collectively illustrate, recognising and addressing cognitive biases is a precondition for knowledge co-creation and sharing, as only by unlearning entrenched assumptions can space be opened for alternative framings and more biodiversity-positive pathways.

Experiential learning, experimentation, play

Transformative change requires creating opportunities where knowledge is not transmitted but discovered through practice. The TCSs show that co-creation often advances when participants experiment together, test boundaries, and learn through embodied engagement. This reflects the importance of “transformative learning” (Mezirow, 2000), which emphasises the transformative potential of learning through hands-on experiences, critical reflection, and creativity as new pathways.

In the Hungarian seeds case, for example, experimentation centred on collective seed trials and participatory plant breeding. Farmers and seed savers communities work together to test varieties under different conditions, exchanging observations and practices. These hands-on approaches make genetic diversity tangible and show how knowledge co-creation can safeguard agrobiodiversity while also building resilience in food systems.

In the German urban youth case, experiential learning was enabled through playful and creative interventions that allowed young people to connect with biodiversity in accessible ways. Activities included barefoot forest walks, silent meditations, outdoor cinema screenings, and the “Pathbreak: A Biodiversity-Food-Governance Game”, which simulated real-world dilemmas at the intersection of food, biodiversity, and

governance. By playing the game, the young people could recognise how their own choices shaped ecological futures and governance outcomes.

In the Hungarian education case, school gardens became a site of experimentation for both students and teachers. Transforming a neglected green space into a functioning garden involved trial, error, and discovery. Arts-based and participatory methods allowed children to express feelings and reflections, and practical gardening linked knowledge to concrete action.

In the Swiss religion case, experimentation took the form of farmers producing and curating personal photographs that connected spirituality with biodiversity care. Sharing these images in exhibitions invited to dialogues in churches and community halls, where visitors could reflect and add their perspectives. This creative experiment made hidden values visible, showing that knowledge creation can emerge through artistic processes that legitimise personal and spiritual dimensions of biodiversity.

The cases show that experiential learning, experimentation, and play are powerful drivers of knowledge co-creation and sharing, as they enable participants to generate, test, and exchange insights through lived practice rather than abstract instruction. These low-risk experiments help people connect their values with everyday actions, making it easier for new ways of doing things to take hold and spread across different levels (O'Brien et al., 2023).

Immersive experiences

Transformative change requires environments where people can engage with biodiversity not only intellectually but through deep, lived immersion. The TCSs show that co-creation often reaches its full potential when participants are drawn into settings that surround them with ecological, cultural, or spiritual meaning (Hutchinson et al., 2025), as such contexts surface diverse worldviews and values that provide the depth, legitimacy, and durability needed for systemic change. Such immersive experiences dissolve boundaries between knowledge and practice, enabling participants to connect with the topic of biodiversity as part of their identities and daily lives.

In the Swiss religion case, for example, immersive experience was created through photo exhibitions that placed visitors in reflective spaces where faith and farming intersected. Walking through images curated by farmers, participants encountered biodiversity as a moral and spiritual question. The exhibitions allowed audiences to pause, contemplate, and discuss intimate values, fostering a deeper connection with biodiversity and ethical responsibility.

In the Hungarian school education case, the school garden itself became an immersive learning environment. Students engaged directly with soil, plants, and seasonal cycles, experiencing biodiversity through gardening routines of planting, tending, and harvesting. The gardens surrounded children with nature as a living classroom, where ecological processes were learned not only cognitively but through connections with the work in the garden.

In the Germany Urban Youth case, immersion was created by taking young people out of their everyday routines and into environments where they could experience biodiversity as an atmosphere rather than a lesson. Overnight stays in forests, shared

outdoor meals, and collective rituals like storytelling surrounded participants with sounds, smells, and sensations of nature that could not be replicated in indoor settings.

4.3 Agency

Agency is a central dimension of transformative change. The TCSs show that biodiversity transformation depends not only on people being included but also on them seeing themselves as capable of making a difference. Agency was cultivated through opportunities for active stewardship of land and resources, and through recognition that even small everyday actions can have wider ecological and social effects. Both forms were crucial in shifting participants from passive observers to active contributors in biodiversity governance. Creative safe spaces and processes of knowledge co-creation played a decisive role in this shift as well: by providing inclusive, trusting environments and valuing diverse forms of expertise, they enabled participants to recognise their capacity to act. Agency emerges when actors recognise their ability to shape systems despite structural constraints; it is not only the capacity to act but also the awareness that individual and collective practices can influence broader social-ecological dynamics (Avelino & Wittmayer, 2016). Hutchinson et al. (2025) link this to adaptive learning and ratcheting processes that move from personal and practical change into political arenas. Even within rigid governance frameworks or unequal power relations, agency is expressed when people identify leverage points, mobilise alliances, and reframe dominant narratives to open new possibilities for change. These dimensions reinforced each other, as safe spaces made co-creation possible, while co-creation in turn deepened agency by allowing participants to shape decisions and imagine alternative futures.

Active stewardship

The TCSs show that agency grows strongest where participants are entrusted with roles involving (gradually increasing) decision-making in community and societal matters affecting them directly, becoming active stewards of land, food, and landscapes, and turning care into practice and governance.

The Hungarian seeds case, for example, shows how agency can be expressed through collective experimentation with seed trials and participatory plant breeding. Farmers and seed-saver communities take the lead in testing varieties under different ecological and climatic conditions, exchanging observations and practices. These hands-on processes not only safeguarded agrobiodiversity but also gave actors a sense of control over their food systems. By engaging directly with genetic diversity, farmers reclaimed agency from market and policy structures that often limit their choices, asserting themselves as active stewards.

The Graz-based case offered women* a chance to shape an urban green space from the ground up. Beyond cultivation, participants made decisions on planting, maintenance, and collective use of the space. Their stewardship was visible not only in ecological practices but also in establishing rules and routines that ensured continuity. Over time, their agency expanded into exchanges with municipal actors, demonstrating that stewardship could extend from the initiation and maintenance of a community garden into urban governance.

In the UK case, agency was expressed through the ability of Black, Asian and ethnic minority communities to reclaim their presence in rural landscapes. Their stewardship did not take the form of land management but of reframing who belongs in nature, thereby contesting cultural exclusion. By bringing new histories and perspectives into countryside initiatives, environmental stewardship was defined as both ecological and cultural.

In the Hungarian school garden case, stewardship developed through the daily responsibilities of students and teachers in caring for a once-neglected green space. The case study gardens became collective projects, but their broader vision was to manifest change within the school system itself. By demonstrating that ecological and participatory learning could be integrated into formal education, the gardens aimed to shift teaching from abstract instruction toward experiential practice, linking biodiversity with everyday routines and school culture.

These examples show that stewardship is not limited to ecological labour but includes advocacy, cultural recognition, and participatory governance.

Little actions

Transformative change often begins with small steps. The TCSs illustrate that seemingly modest acts, such as sharing memories in a WhatsApp group or planting a seedling, can nurture agency by showing that every contribution matters. These little actions, while incremental, may accumulate into broader transformative change.

In the Swiss religion case, for example, little actions took the form of farmers providing personal photographs for the exhibition. Selecting a single image or writing a caption was a modest act, but it opened safe pathways for expressing deeply held values. By validating these contributions as meaningful knowledge, the process strengthened farmers' sense of agency, demonstrating that their moral and spiritual perspectives are important in shaping biodiversity debates.

In the UK, agency was also fostered through incremental acts of participation. For some, joining a single countryside walk was a significant first step in overcoming feelings of alienation. Others engaged by contributing reflections in a WhatsApp group or by sharing memories of gardening and food traditions. While modest in scale, these acts helped participants to expand their involvement in collective activities gradually.

The cases show that little actions matter because they create low-threshold entry points into building confidence, capacities and momentum for larger transformations.

Becoming actors of change

Transformative change depends on people not only taking part in activities but also developing the confidence, skills, and recognition to influence systems. The TCSs demonstrate that empowerment is not given but built gradually: through capacity building, peer support, and opportunities to take initiative, case study participants moved from hesitant involvement to becoming actors of change.

In the Urban Youth case, the LC functioned as a platform for collective empowerment and became an incubator of agency. Through immersive experiences, collective reflection, and opportunities to co-lead interventions, they gradually began to recognise

their own capacity to influence change. Some members even secured funding from highly competitive calls and are now leading international youth projects on biodiversity. They have become biodiversity champions, launching ambitious initiatives largely on their own and inspiring peers across countries. Their journey demonstrates how inclusion, safe spaces, and co-creation can cultivate durable agency that extends far beyond the immediate scope of a project.

In Graz, for example, initially the women* joined as participants with little experience in gardening or public decision-making. Through co-design processes, facilitation, and collective experimentation, they gained ecological and organisational skills. Over time, they moved from users of a green space to advocates for it, voicing their perspectives in discussions with municipal representatives and making their needs visible. This shift illustrated how empowerment can turn local stewardship into political agency.

In Oslo, agency was cultivated as children with disabilities and professionals supporting them built confidence to act in new roles. Professionals who initially felt uncertain about language and expectations grew more assured through dialogue with mentors with disabilities and participatory reflection. Children, meanwhile, were recognised as active agents, shaping outdoor recreation through their choices and experiences. Together, these changes influenced the wider recreation system, aiming at embedding inclusion into municipal strategies and organisational routines.

In the Hungarian school garden case, becoming actors of change was tied to the empowerment of students and teachers to question and reshape existing educational practices. With the guidance of a committed “lighthouse teacher” and support from researchers, the gardens became arenas for experimenting with alternative pedagogies that prioritised cooperation, reflection, and creativity. Students who were often disengaged in traditional classrooms discovered new capacities for expression and responsibility, while teachers gained confidence to depart from rigid hierarchies and curricula. The process also demonstrated institutional change, as the school community began to recognise the value of participatory and experiential learning.

The cases demonstrate that becoming actors of change is a gradual process of empowerment, in which confidence and skills are cultivated through interaction, co-creation, and recognition, enabling participants to move from engagement to influence in shaping biodiversity and the systems around it.

4.4 Partnering instead of separation

Transformative change depends on collaboration across divides. The TCSs show that transformative actions flourish when actors, communities, and sectors form partnerships rather than remain separated. Such partnerships should allow marginalised voices to be heard, everyday practices to connect with institutions, and fragmented sectors to address interdependencies. Across various contexts, partnering involved building cultural bridges, fostering living networks, and initiating cross-sectoral dialogue. Partnerships that engage the personal sphere of values and identities, the political sphere of power and representation, and the practical sphere of tools and skills help to create coherence across levels, which represents a key condition for scaling transformation through shared values and relationships (O'Brien et al., 2023). At the same time, partnering often slows down processes, as dialogue and building shared

understanding require time and effort. However, this investment pays off by creating stronger, more resilient foundations for long-term change. This resonates with insights from transition governance research, which shows that co-production and dialogue in multi-actor partnerships are time-intensive but ultimately strengthen the legitimacy and durability of transformative change (Frantzeskaki & Rok, 2018). Without this dialogue, governance risks remain within narrow anthropocentric framings that reproduce lock-ins (Hutchinson et al., 2025).

Cultural bridges

The Learning Communities of place-based cases, as well as the engagement activities within sector-based cases often required bridging cultural divides to enable constructive interaction, co-creation and collaboration.

In the German Urban Youth case, for example, creative interactive formats helped the young people from diverse migration and socio-economic backgrounds to meet on equal terms. These bridges made it possible for participants to engage with each other and establish relationships across differences.

In the UK case, cultural bridges were built through community-based activities that brought together participants from diverse cultural backgrounds, many of whom felt excluded from countryside spaces and biodiversity debates. Sharing stories, music, and artefacts created a setting where different cultural identities and experiences could be shared and recognised. This gave room for and legitimised diverse perspectives that redefined who belongs in environmental action.

In the trade case, partnering across divides meant confronting extractivist supply chain logics and recognising the perspectives of those most affected by them. Rather than framing biodiversity loss as a distant ecological issue, the process created spaces where Indigenous representatives, civil society, researchers, and EU actors could engage in dialogue. By fostering cross-regional dialogue, the case demonstrated how building bridges between producers, Indigenous communities, and European decision-makers can reframe trade not merely as economic exchange but as an issue of justice and biodiversity responsibility.

The TCSs show that cultural bridges are essential for transformative change, as they may create mutual recognition across differences and open pathways for collaboration and co-creation.

Living networks

Partnerships also took the form of living networks, which in turn isolated efforts into sustained collaborations, enabling knowledge and practices to circulate across scales and embedding biodiversity care within broader social and institutional systems.

In Oslo, for example, networks between children with disabilities, their families, professionals, and municipal actors became the basis for embedding inclusive outdoor recreation into policy. These networks are crucial for moving from isolated pilot camps to systemic change.

In Hungary, the school gardens foster networks between teachers, researchers, and pupils. The gardens serve as hubs where new teaching practices and ecological skills

are exchanged, gradually influencing educational culture and creating durable partnerships within and across schools.

In the Hungarian seeds case, living networks were sustained through the work of the Magház Association, a community seed bank in Hungary that links gardeners, small-scale farmers, and civil society actors. The networks enable the exchange of open-pollinated varieties, practical know-how, and collective trials of seeds across diverse landscapes. Trust and reciprocity are central: members rely on each other's observations, support joint experiments, and contribute to a shared pool of knowledge. International ties with organisations like Arche Noah and the "Let's Liberate Diversity" movement further extend these networks, embedding local practices in European debates.

Cross-sectoral dialogue

Finally, partnering across institutional and sectoral boundaries was essential for broadening the scope of biodiversity debates and addressing systemic impact.

In the finance case, cross-sectoral dialogue brought together researchers, NGOs, and financial actors to question how investment practices undervalue biodiversity. Reflexive workshops surfaced cognitive biases such as loss aversion and status quo thinking, which had led to biodiversity being treated as an "externality". By naming these biases and discussing them openly, financial professionals were encouraged to reflect on their own decision-making processes.

In the fashion case, dialogue connected small- and medium-sized enterprises with researchers and civil society to envision pathways for a biodiversity-positive fashion sector. Through workshops, participants identified leverage points such as sufficiency, circularity, and labour rights, issues which are rarely considered together in conventional fashion debates.

In the migrant agricultural workers case, participatory research revealed the experiential knowledge of seasonal farm labourers, whose skills in weeding, diversification, and maintaining field margins are crucial, but often not considered as a knowledge source. A vision of engaging both farmers and migrant workers in joint reflection makes visible how migrant labour could sustain ecological practices across Europe. Recognising workers as knowledge-holders, rather than only as a workforce, could build new bridges between agriculture, biodiversity policy, and labour rights. These partnerships opened discussions on how fairer working conditions and biodiversity stewardship are interlinked.

The TCSs show that cross-sectoral dialogue expands the boundaries of biodiversity governance through partnerships that connect economic, social, and ecological domains and open pathways toward more systemic change.

4.5 Regulations for social and environmental justice

Transformative change depends on regulations that align biodiversity protection with principles of justice. The TCSs reveal that laws, standards, and informal norms play a decisive role in shaping which practices are enabled and whose interests are served. Current frameworks prioritise economic growth and efficiency, overlooking social

equity and neglecting ecological limits. By contrast, the TCSs illustrate how regulations can be re-imagined, supporting circularity and sufficiency, balancing voluntary and binding measures, and providing space for bottom-up initiatives to thrive. Such reimagining also entails a shift in power, both economic and political, from dominant actors to grassroots initiatives and community changemakers. This redistribution is essential for fairer and more sustainable futures, but it can be highly conflictual as it directly contests the status quo. These approaches demonstrate that regulation is not only a matter of control but also a tool for enabling fair and sustainable futures. In consequence, transformative change relies on the interplay between bottom-up initiatives and top-down steering, with enabling institutional frameworks that allow governance models to integrate equity, inclusivity, and long-term resilience into sustainability (Patterson et al., 2017; Scoones et al., 2020) and biodiversity governance (Hutchinson et al., 2025).

Circularity, sufficiency, and care

In several TCSs, regulations were re-imagined to support circular practices, sufficiency, and care as guiding principles. Unless regulation supports sufficiency and reciprocity, mainstream approaches risk reinforcing anthropocentric and growth-oriented logics (Hutchinson et al., 2025).

In the Hungary seeds case, for example, regulations were directly linked to the ability of farmers and seed-savers to exchange and reproduce open-pollinated varieties. Current EU seed laws favour uniform, commercial varieties, restricting the circulation of diverse, locally adapted seeds. Through collective trials and participatory plant breeding, members of the Magház network show how these exchanges could safeguard agrobiodiversity and strengthen resilience in farming systems. Their work highlights the need for regulatory frameworks that protect community seed systems and value practices of care and reciprocity over market concentration and standardisation.

In the fashion case, workshops revealed how current regulations focus mainly on consumer safety and product quality, while ignoring biodiversity impacts and labour conditions in global supply chains. Small and medium-sized enterprises, activists, and researchers jointly identified sufficiency and circularity as leverage points: reducing overproduction, extending product lifecycles, and promoting repair and reuse. The case also underlines that ecological standards cannot be separated from social justice, since biodiversity loss is closely tied to exploitative labour practices along the textile value chain. The case therefore points to the need for regulatory frameworks that move beyond “green growth” narratives, integrating biodiversity protection with sufficiency strategies and fair working conditions.

The finance case revealed that investment frameworks systematically undervalue biodiversity. Existing regulations primarily emphasise financial risk management and short-term returns, treating biodiversity loss as an “externality” rather than a central factor in decision-making. Reflexive workshops with financial actors, NGOs, and researchers surfaced cognitive biases such as loss aversion and status quo thinking, which reinforced this neglect. Participants discussed how voluntary sustainability reporting, while useful for awareness, remains insufficient for changing investment logics. The case highlights the need for binding disclosure standards and stronger accountability mechanisms that integrate biodiversity into core financial rules. Such

regulations would reorient financial practices toward long-term sufficiency and care, moving beyond profit maximisation to recognise ecological and social value.

The TCSs indicate that re-imagining regulations around circularity, sufficiency, and care can redirect markets and institutions away from short-term profit and standardisation toward biodiversity protection, social justice, and resilience.

Let bottom-up initiatives thrive

The TCSs highlight that regulation and policy must leave space for local, bottom-up initiatives to develop and flourish. Many transformative practices begin as small-scale, community-driven experiments, which risk being stifled if governance frameworks impose rigid rules on them, or fail to recognise grassroots agency. Supportive conditions such as flexibility, recognition, and continuity allowed local actors in the PLANET4B cases to shape biodiversity practices in ways relevant to their contexts and, in some instances, to influence broader policy debates.

What enabled the GAIA Gartenberg garden in the Austrian case to thrive and even expand into a community park beyond the project activities was not only the careful process of setting it up, supported by sensitive facilitation. A crucial precondition was the municipality's support: providing the plot and necessary infrastructure, while also helping to explore what was possible within the legal framework. Equally important was the recognition of the garden as a good practice in implementing the city's recent strategies for urban green space development. Ultimately, the municipality's openness to engaging with diverse voices and integrating them into urban green space governance created the basis for a lasting impact. This case shows that municipal regulation works best when it enables community-led innovation rather than imposing rigid templates.

In Hungary, the school gardens showed how bottom-up initiatives can thrive when teachers, students, and researchers are given space to experiment outside rigid national frameworks. What allowed these initiatives to grow was not top-down reform, but rather local flexibility, including supportive school leadership, openness to peer-to-peer exchange, and collaboration with NGOs and researchers. The gardens became part of everyday routines, while also pointing to systemic change by inspiring other schools and feeding into debates on education policy. The case demonstrates that to let bottom-up initiatives thrive, regulations need to recognise and enable the creativity and commitment of schools themselves, rather than prescribing uniform models "from above".

In Oslo, network meetings, seminars, and workshops brought together researchers, a competence network of peer mentors and parents, outdoor organisations, disability organisations, health organisations, and municipal actors. Through a bottom-up approach, starting with the lived experiences and expertise of the peer mentors, these meetings contributed to establishing new dialogues across sectors and helped identify barriers and propose solutions. Encounters between the competence network and outdoor organisations, and among researchers, outdoor organisations, disability organisations, and the municipality have helped build confidence and inspired actors to mobilise their networks. This shows that impact starting at the individual level can expand to organisations and lead to dialogue across sectors, hopefully inspiring systemic changes in outdoor recreation.

Bottom-up initiatives thrive when institutions provide flexibility, recognition, and continuity, turning experiments of limited duration into durable practices with community ownership. By creating room for grassroots agency in education, urban gardening, and outdoor recreation, regulations can transform local innovation into systemic change that reshapes governance cultures and biodiversity policy.

4.6 Bringing the elements together: scaling transformative change

Taken together, the five elements highlighted in this section show that transformative change for biodiversity emerges from the interplay of values, mindsets, actions, and structures, rather than from isolated interventions. **Figure 2** visualises this dynamic: transformation begins with shifting values in creative safe spaces, expands into new mindsets through knowledge co-creation, translates into collective actions and partnerships, and ultimately reshapes governance and regulation to redistribute power. Across all levels, the red arrow points to agency as the cumulative outcome: people recognising themselves as stewards and actors of change, with even small everyday actions contributing to systemic shifts.

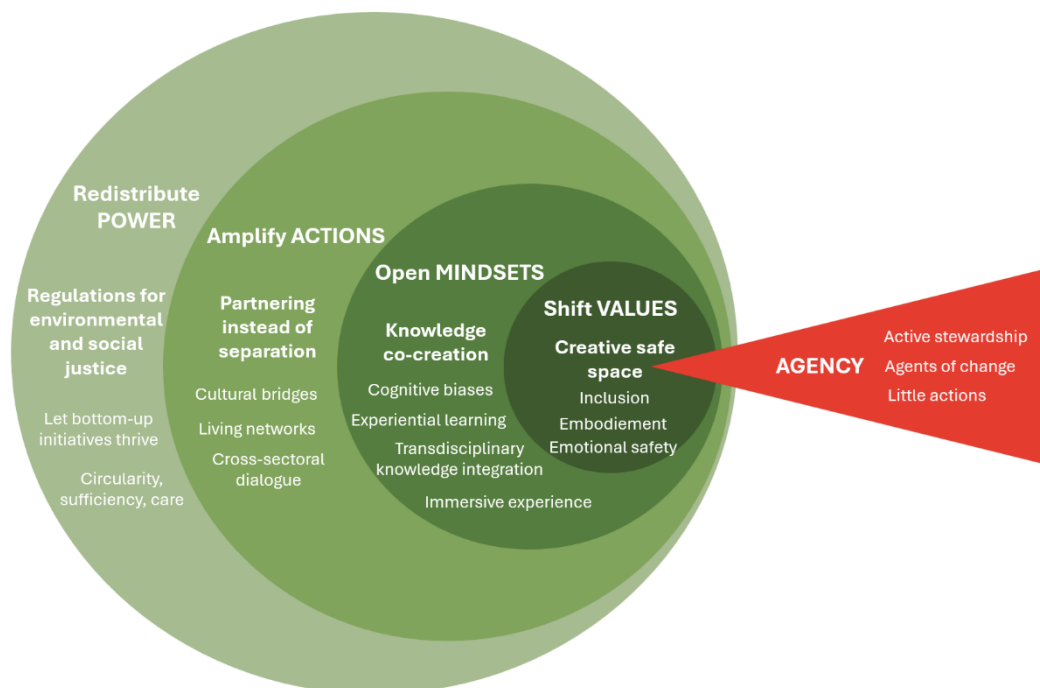


Figure 2. From safe spaces to systemic change (own elaboration inspired by Karen O'Brien's three spheres of transformation).

This pathway reflects Vogel & O'Brien's (2022) call to move *across, over, and beyond* entrenched boundaries through **transdisciplinary, transgressive, and transcendent approaches**. Creative safe spaces, embodied learning, and cross-sector partnerships, as shown in our cases, exemplify these boundary-crossing strategies. It also resonates with O'Brien et al.'s (2023) concept of “**fractal agency**” within the three spheres of transformation (personal, political, practical). When grounded in universal values such as care, dignity, and fairness, small and local initiatives generate patterns that repeat across scales, linking bottom-up practices with structural and institutional change.

In this sense, the Transformative Change Stories illustrate how cultivating values and agency at the micro level can trigger broader systemic transformation. They confirm that transformative change to address biodiversity loss is as much about reconfiguring relationships and meanings as it is about reforming policies and institutions.

5 Insights across Transformative Change Stories

The Transformative Change Stories do not only highlight specific points of change, as discussed in Section 4, but also offer broader insights into the conditions under which transformation takes place. Taken together, they show that biodiversity is experienced and acted upon through social, cultural, and institutional dynamics, and that transformation unfolds in contested spaces shaped by values, power relations, and global interdependencies. The following subsections synthesise these cross-cutting insights, illustrating them with examples from across the 11 cases.

5.1 Biodiversity as a social-ecological issue

Across all 11 cases and stories, biodiversity emerges not as an isolated ecological matter but as inseparable from social realities. It is linked to health and well-being, cultural identity, food and labour systems, and everyday practices. The stories show that biodiversity is always co-constructed through social structures, institutions, and cultural norms, rendering the ecological and social dimensions mutually dependent. This implies that transformative change must address both environmental processes and the social arrangements through which biodiversity is lived and governed.

Biodiversity was framed in some cases as part of daily survival and wellbeing, such as in school gardens where children's health and learning were directly linked to ecological care, while in others it was exposed as a structural justice issue, as in the soy and beef trade case, where biodiversity loss was tied to Indigenous dispossession and European consumption. This shows that transformation must address both immediate community needs and global systemic drivers.

5.2 Values, mindsets, and cultural change

The cases underline that transformative change addressing biodiversity loss depends on cultural and cognitive shifts. Prevailing logics of growth, consumerism, and short-term gain consistently undermine biodiversity, whereas orientations of care, reciprocity, sufficiency, and stewardship open new pathways for change. How biodiversity is valued – whether as heritage, livelihood, moral duty, or economic asset – shapes which forms of action are possible. Transformation requires not just technical solutions but a reframing of cultural narratives and institutional priorities.

Some stories emphasised values rooted in everyday practices and ethical reflection, as when Swiss farmers engaged with spiritual framings of land stewardship. Others exposed how dominant economic logics devalue biodiversity, as seen in finance, where short-term returns overshadow long-term ecological risks. Taken together, the TCSs that cultural change requires both cultivating new values and dismantling worldviews that systematically marginalise biodiversity.

5.3 Biodiversity and belonging

Belonging emerged as a decisive condition for engagement. When people could see themselves as legitimate participants in biodiversity futures, their motivation and commitment deepened. Belonging was created where initiatives recognised diverse histories, experiences, and knowledge, enabling people to identify biodiversity care as part of their collective life. Conversely, where belonging was absent, participation remained fragile or exclusion was reinforced. Belonging therefore operates as both a means and an outcome of transformative change addressing biodiversity loss.

Belonging was nurtured through direct practices of participation, such as collective gardening, where people gained recognition and agency, as well as through symbolic recognition. As seen in the UK case, it is important to challenge prevailing narratives that position minority communities as separate from nature, especially against a backdrop of racialised exclusion. This shows that belonging is produced through both material engagement with biodiversity and through challenging cultural narratives of who “counts” in nature.

5.4 Intersectionality

Our cases demonstrate that overlapping inequalities shape both vulnerabilities and capacities to engage with biodiversity. Gendered responsibilities, migration backgrounds, economic precarity, racialised exclusion, and disability all influence who can participate and how. When overlapping inequalities were explicitly recognised and actively addressed, biodiversity initiatives were able to broaden participation, diversify knowledge, and build resilience. Intersectionality thus emerges not as an optional add-on but as a structural condition of effective and just biodiversity action.

Some cases explicitly designed interventions around intersectionality, for example, through providing childcare, translation, or offering direct benefits, such as food, while others revealed intersectional barriers more indirectly, such as in fashion supply chains where gender, class, and geography intersect in exploitative labour conditions. Together, our cases highlight that biodiversity action becomes transformative when it actively addresses how inequalities overlap across everyday and structural levels.

5.5 Power and representation

Transformative change needed to address biodiversity loss is never neutral: it redistributes visibility, recognition, and influence. The stories reveal how entrenched hierarchies between experts and citizens, producers and consumers, or North and South, shape whose voices matter in biodiversity governance. Power is exercised not only through formal institutions but also through cultural narratives and economic structures. Transformative change requires making representation intentional, ensuring that marginalised voices are not only present but also influential, and that diverse knowledge systems are considered and valued in decision-making.

In some contexts, power imbalances were obvious, such as children with disabilities challenging urban planning norms, while others highlighted systemic invisibility, e.g. when seed-saving networks were marginalised by industrial agriculture. This underlines that representation must be intentionally structured so that marginalised actors are not only invited to participate but can shape agendas and outcomes.

5.6 Policy-institutional environment and governance

Institutional frameworks strongly condition the space for transformative change. Supportive governance can provide recognition, continuity, and resources for grassroots practices, while rigid bureaucracies, short project cycles, or fragmented responsibilities constrain their potential. The stories demonstrate that durable change necessitates governance cultures that are inclusive, flexible, and long-term in orientation, and that effectively bridge local innovation with broader policy agendas at national, EU, and global levels.

Local and national authorities functioned at times as enablers, as when municipalities integrated grassroots biodiversity initiatives into urban strategies by securing continuity, legitimacy, and resources, while others constrained action, as with seed regulations that privileged industrial systems over community-based diversity. This dual role demonstrates that transformation depends not only on mobilising communities but also requires reshaping governance systems to amplify innovation and inclusion rather than contain them.

5.7 Local-global interlinkages

Finally, the TCSs highlight the inseparability of local and global dynamics. Biodiversity challenges are often driven by global economic and regulatory systems yet materialise in specific places, while local initiatives can inspire wider debates and alliances. Whether through trade, finance, migration, or cultural exchange, biodiversity transformation is shown to be multi-scalar: shaped by global drivers but also capable of generating insights that travel across borders. Recognising these interconnections is crucial for embedding local experiments into systemic change.

In some cases, biodiversity pressures could be traced directly to global systems, such as commodity chains in soy, beef, and fashion, while others demonstrated how local experiments, such as intercultural youth learning, created ripples that reached into international debates. Together, our cases underline that transformation is reciprocal: local practices cannot thrive without systemic support, but they also generate alternative imaginaries that challenge global systems.

Taken together, the cross-cutting insights from TCSs make clear that protecting biodiversity is never just about nature alone. It is always tied to how people live, work, and relate to each other. Change happens when values shift towards care and responsibility, when people feel they belong, and when inequalities are recognised and addressed. Power relations and formal and informal institutional arrangements (including norms, customs, etc.) shape what is possible, while global markets and policies strongly affect what happens locally. The stories also show that transformation is rarely smooth: it is contested, negotiated, and often fragile. Yet by linking local initiatives with wider systems and by making space for diverse voices and perspectives, it becomes possible to create futures that are both ecologically sustainable and socially fair.

6 Challenges and tensions

The 11 TCSs reveal a series of recurring challenges and tensions that cut across different thematic and geographical contexts. While each case faced its own specific obstacles, several cross-cutting issues emerge, which highlight the complex and sometimes contradictory conditions under which biodiversity-related transformations unfold.

Participation, inclusion, and safety proved to be persistent concerns. Many cases sought to engage groups often underserved or marginalised, but this required substantial investment in facilitation and support. In Graz, translation, childcare, and long-term facilitation were essential to enable women* to participate. The UK case emphasised trust-building and culturally safe spaces for Black, Asian and ethnic minority participants, while Oslo highlighted that institutional commitments to inclusion do not automatically eliminate barriers for children with disabilities. The Urban Youth case faced uneven engagement over time, showing the difficulty of sustaining youth participation across school terms. Across these cases, a tension emerged between maintaining safe, inclusive environments and responding to pressures for broader public engagement.

Institutional embedding versus grassroots autonomy was another challenge. Graz and Oslo benefitted from strong municipal connections, which gave their work political traction but also risks bureaucratisation and a loss of grassroots ownership. In contrast, the UK and Urban Youth cases prioritised community autonomy and informal learning, which fostered empowerment but limited formal policy uptake. The Swiss case engaged with churches and agricultural schemes as intermediaries, balancing institutional legitimacy with cultural and artistic independence. These examples illustrate the challenge of balancing the need for institutional support with the preservation of grassroots innovation.

Tensions also surfaced around **knowledge, evidence, and evaluation** (see also in [D3.2 Report on the system mapping and leverage points for each case](#)). Many cases valued embodied, situated and experiential learning through storytelling, exhibitions, or retreats, which generated deep local insights but are hard to translate into the indicators typically demanded by policymakers. Oslo, for instance, had to navigate between ethnographic insights and technical planning metrics, while FiBL's creative outputs challenged conventional evaluation frameworks. The Swiss case produced reflective artefacts and curatorial outputs, such as the exhibition, which created awareness and dialogue but could not easily be assessed. More broadly, all cases wrestled with how to communicate situated, context-rich narratives in ways that generate lessons practical for broader application.

Economic and market pressures repeatedly constrain transformative ambitions. The fashion and finance cases show how sufficiency and long-term stewardship are difficult to advance within systems structured around growth logics, short-term profits, and consumer demand. In Hungary's agrobiodiversity case, the consolidation of seed markets undermined community-led seed diversity initiatives. Even in place-based cases, inclusive facilitation, accessibility adaptations, and long-term engagement were chronically underfunded compared to infrastructure investments, exposing a structural undervaluation of social processes in biodiversity policy.

Time and continuity were recurring difficulties. The Graz-based case built for the successful realisation of the LCs on several previous projects, contacts and networks. To stabilise the GAIA gardening community, weekly activities were implemented during the whole growing season (and beyond). The Oslo case points to long-term engagement to adapt planning tools, similarly to the German case with urban youth, where maintaining participation beyond project cycles was a key challenge faced. Sectoral cases, such as the fashion and finance ones, acknowledge that structural shifts in global markets and institutions far exceed the lifespan of individual projects. This raises the shared concern of how to prevent promising pilots from withering once project funding ends, and how to secure resources for the slow, cultural work of transformation.

Methodological tensions within the SoE and TCS elaboration processes also emerged. While the structured templates provided comparability, some cases found them constraining. Urban Youth opted for interviews instead of a single workshop to respect participants' rhythms. FiBL adapted the SoE to a team reflection, raising questions about how flexible the methodology can or should be. Moreover, the need to balance compelling storytelling with analytic rigour was felt to be difficult across cases, as narratives risked becoming advocacy if not grounded in transparent evidence. Several case study teams felt that tasks such as leverage-point mapping were overly academic and difficult to translate correctly for their target groups.

Finally, all cases confronted the challenge of **local-global interconnections**. Local initiatives often encountered structural drivers beyond their control: Hungarian seed networks are constrained by EU and global seed regulations; fashion revealed how consumer choices in Europe contribute to biodiversity loss in distant ecosystems; and finance demonstrated how transnational capital flows influence local ecologies. Conversely, cases like Urban Youth used international exposure, such as a trip to Iceland within an exchange project, and a number of newly approved individual projects developed by the LC members, to connect local experiences to global ecological debates. This tension points to the limits of local action in the absence of systemic change, but also to the power of local experiments to inspire broader transformation.

All these challenges show that biodiversity transformations are never linear or harmonious. They require navigating tensions between safety and openness, autonomy and institutionalisation, experiential learning and policy metrics, sufficiency and market logics, and local practices and global structures. However, these tensions should not only be seen as obstacles but as the very sites where transformation can take place. Frictions may force actors to question assumptions, adapt strategies, and build new alliances, which in turn can generate more resilient and context-sensitive pathways for transformative change needed to address biodiversity loss.

7 Conclusions and outlook

The PLANET4B Transformative Change Stories provide rich material for understanding how biodiversity can be reframed and enacted in different contexts. Across the cases, biodiversity emerges as a social–ecological issue, entangled with social practices, cultural meanings, political contexts, and economic systems. Transformation is not only about technical interventions, but also about reconfiguring the relationships between people and non-human nature, between communities and institutions, and between local practices and global structures. The cases demonstrate that transformative change requires attention to this by cultivating values of care and reciprocity, recognising the importance of belonging, addressing intersecting inequalities, and navigating complex governance landscapes that span from the local to the global.

The diversity of cases demonstrates that transformation can take many forms, however, across this diversity, a set of core learnings emerged:

1. **Biodiversity is a social–ecological issue:** It is inseparable from justice, identity, cultural practices, and physical and mental health. Effective transformation requires addressing both social structures and inequalities, as well as environmental concerns.
2. **Inclusion is fundamental:** Transformative change cannot occur without addressing who participates, whose knowledge counts, and whose voices are heard. Practical measures (translation, childcare, adaptive infrastructure) and cultural recognition (challenging racism, disability stigma, gender norms) are equally important to grant inclusiveness.
3. **Creative safe spaces enable transformation:** By lowering thresholds, fostering embodied practice, and ensuring emotional safety, such spaces empower marginalised groups to experiment, gain confidence, and act as co-creators of biodiversity futures.
4. **Embodiment deepens connection:** Biodiversity becomes tangible through hands-on practices such as gardening, hiking, role-playing, and seed saving. Experiential learning anchors ecological knowledge in daily routines, relationships, and lived experience.
5. **Values and cultural change drive transformation:** Changing how biodiversity is valued opens new pathways for action. Cultural, spiritual, and religious framings can legitimise and inspire commitments to biodiversity that go beyond what scientific arguments alone can achieve.
6. **Knowledge pluralism strengthens transformation:** Embodied, artistic, and experiential forms of knowledge are as important as “formal” expert knowledge but require translation to be recognised in policy and science. Translation between community learning and policy frameworks remains a core challenge.
7. **Policy-institutional environment and governance can enable or constrain:** Supportive municipalities, schools, churches, or associations provide legitimacy, resources, and continuity. Yet lack of flexibility, short-term funding, and rigid regulations often limit grassroots agencies.
8. **Grassroots innovation and institutional embedding must be balanced:** Cases demonstrated both the risk of bureaucratisation and the fragility of isolated community action. Sustainable transformation requires partnerships that protect community autonomy while ensuring political traction and continuity.

- 9. Transformation is a relational and ongoing process:** Change emerges from building trust, fostering relationships, and cultivating long-term engagement. It is not a linear process but layered, requiring continuity of facilitation and openness to adaptation.
- 10. Time and continuity matter:** Transformative initiatives require multi-year cycles, consistent facilitation, and stable funding, while short project timelines risk undermining lasting impact.
- 11. Economic logics are central challenges:** In sectors such as finance, fashion, agriculture, and trade, biodiversity is undermined by growth imperatives, global supply chains, and precarious labour. Transformative change necessitates rethinking investment cultures, consumer norms, and regulatory frameworks.
- 12. Tensions can create productive spaces:** Challenges of sustaining participation, balancing autonomy with institutional embedding, and linking local practices to global structures may become arenas for negotiation and innovation, where new alliances can emerge.

In conclusion, our cases provide grounded examples of where transformative leverage can be found and how participatory methods with an intersectional approach can be scaled and adapted. Beyond the project, they provide inspiration and evidence for researchers, policymakers, civil society actors, practitioners and those who aim to integrate biodiversity into social, cultural, and institutional change processes. The narratives show that transformation is possible, but only when biodiversity is recognised as integral to justice, well-being, representation, and collective futures.

The outlook is therefore both hopeful and cautionary. Hopeful, because the cases document tangible shifts in mindsets, institutions, and practices that open new pathways toward biodiversity-positive futures. Cautionary, because these efforts remain fragile, often under-resourced, and exposed to powerful structural drivers.

The challenge ahead is to sustain, connect, and amplify such initiatives. This means moving from localised project experiments to systemic transformations that reshape institutions, address power imbalances, and foster cultures of justice and biodiversity stewardship.

References

- Avelino, F., & Wittmayer, J. M. (2016). Shifting power relations in sustainability transitions: A multi-actor perspective. *Journal of Environmental Policy & Planning*, 18(5), 628–649. <https://doi.org/10.1080/1523908X.2015.1112259>
- Chai, S. L., Liu, A., Li, X., Guo, Z., He, W., Huang, J., Bai, T. & Liu, J. (2024). Telecoupled impacts of the Russia–Ukraine war on global cropland expansion and biodiversity. *Nature Sustainability*, 7(4), 432–441. <https://doi.org/10.1038/s41893-024-01292-z>
- Convention on Biological Diversity (CBD) (2022). Kunming-Montreal Global Biodiversity Framework. Montreal: CBD Secretariat. <https://www.cbd.int/gbf>
- Crenshaw, K. (1991). Mapping the Margins: Intersectionality, Identity Politics, and Violence against Women of Color. *Stanford Law Review*, 43(6), 1241–1299.
- de Castro, F., de Theije, M., Jain, A. & Adger, W.N. (2025). Transformations to sustainability: Processes, practices, and paradigms. *Global Environmental Change*, 81, 102951. <https://doi.org/10.1016/j.gloenvcha.2025.103007>
- European Commission (2020). EU Biodiversity Strategy for 2030: Bringing nature back into our lives. Brussels: European Commission. https://ec.europa.eu/environment/strategy/biodiversity-strategy-2030_en
- Feola, G. (2015). Societal transformation in response to global environmental change: A review of emerging concepts. *Ambio*, 44(5), 376–390. <https://doi.org/10.1007/s13280-014-0582-z>
- Frantzeskaki, N., & Rok, A. (2018). Co-producing urban sustainability transitions knowledge with community, policy and science. *Environmental Innovation and Societal Transitions*, 29, 47–51. <https://doi.org/10.1016/j.eist.2018.08.001>
- Haraway, D. J. (2008). *When Species Meet*. Minneapolis: University of Minnesota Press. <https://doi.org/10.5749/minnesota/9780816650477.001.0001>
- Herout, A., & Schmid, C. (2015). *Sistematización de experiencias: Ein praxisorientierter Ansatz zur Reflexion und Dokumentation von Projekten*. Vienna: Paulo Freire Zentrum.
- hooks, b. (1994). *Teaching to Transgress: Education as the Practice of Freedom*. Routledge.
- Hutchinson, S., Visseren-Hamakers, I. J., Kok, M., Turnhout, E., Gupta, A., & Persson, Å. (2025). Pathways for transforming biodiversity governance. *Ambio*, 54(2), 215–229. <https://doi.org/10.1007/s13280-025-02215-8>
- Iniesta-Arandia, I., & Ravera, F. (2025). Opening Editorial: The contested nature of climate change – Feminist and decolonial perspectives for transformative adaptation. *Environmental Science & Policy*, 169, 104082. <https://doi.org/10.1016/j.envsci.2025.104082>
- IPBES (2019). *Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. Brondizio, E. S., Díaz, S., Settele, J., & Ngo, H. T. (Hrsg.). Bonn: IPBES Secretariat.
- IPBES (2022). *Methodological assessment report on the diverse values and valuation of nature of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. Balvanera, P., Pascual, U., Christie, M., Baptiste, B., &

- González-Jiménez, D. (Hrsg.). Bonn: IPBES Secretariat.
<https://doi.org/10.5281/zenodo.6522522>
- IPBES (2024). Thematic assessment of transformative change of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. Díaz, S., Pascual, U., Balvanera, P., Christie, M., et al. (Hrsg.). Bonn: IPBES Secretariat.
- Kaijser, A., & Kronsell, A. (2014). Climate change through the lens of intersectionality. *Environmental Politics*, 23(3), 417–433.
- Kelemen, E., Subramanian, S. M., De Vos, A., Amaruzaman, S., Porter-Bolland, L., Islar, M., ... & Zólyomi, Á. (2023). Signposts on the road toward transformative governance: how a stronger focus on diverse values can enhance environmental policies. *Current Opinion in Environmental Sustainability*, 64, 101351.
- Klein, J. T. (2004). Prospects for transdisciplinarity. *Futures*, 36(4), 515–526.
<https://doi.org/10.1016/j.futures.2003.10.007>
- Lang, D. J., Wiek, A., Bergmann, M., Stauffacher, M., Martens, P., Moll, P., Swilling, M., & Thomas, C. J. (2012). Transdisciplinary research in sustainability science: practice, principles, and challenges. *Sustainability Science*, 7(S1), 25–43. <https://doi.org/10.1007/s11625-011-0149-x>
- Leichenko, R., & O'Brien, K. (2019). Climate and society: Transforming the future. Cambridge: Polity Press. 250 pp. ISBN-13: 978-0-7456-8439-0.
- Luger, M., & Cisneros, J. (2003). Systematization of Experiences: Learning from Practice for Social Change. San José, Costa Rica: Alforja/CEAAL.
- Norström, A.V., Cvitanovic, C., Löf, M.F. et al. (2020). Principles for knowledge co-production in sustainability research. *Nature Sustainability*, 3, 182–190.
<https://doi.org/10.1038/s41893-019-0448-2>
- Nowak, K., et al. (2023). Short-term fixes and long-term risks: How economic stability narratives undermine biodiversity. *Conservation Biology*, 37(2), e14193.
<https://doi.org/10.1111/cobi.14193>
- Nowak, K., Bear, D., Dutta, A., Traphagen, M., Żmihorski, M., & Jaroszewicz, B. (2024). Threats to conservation from national security interests. *Conservation biology*, 38(1), e14193. <https://doi.org/10.1111/cobi.14193>
- O'Brien, K., Carmona, R., Gram-Hanssen, I., Hochachka, G., Sygna, L. & Rosenberg, M. (2023). A fractal approach to scaling transformations. *Current Opinion in Environmental Sustainability*, 62, 101273. <https://doi.org/10.1007/s13280-023-01873-w>
- Pascual, U., Balvanera, P., Anderson, C. B., Chaplin-Kramer, R., Christie, M., González-Jiménez, D., ... & Zent, E. (2023). Diverse values of nature for sustainability. *Nature*, 620(7975), 813–823.
- Patterson, J., Schulz, K., Vervoort, J., van der Hel, S., Widerberg, O., Adler, C., Hurlbert, M., Anderton, K., Sethi, M. & Barau, A. (2017). Exploring the governance and politics of transformations towards sustainability. *Environmental Innovation and Societal Transitions*, 24, 1–16.
<https://doi.org/10.1016/j.eist.2016.09.001>
- Pereira, L., Bennett, E., Biggs, R., Peterson, G., McPhearson, T., Norström, A., Olsson, P., Preiser, R., Raudsepp-Hearne, C. & Vervoort, J. (2018). Seeds of the future in the present: Exploring pathways for navigating towards “Good

- Anthropocenes". *Current Opinion in Environmental Sustainability*, 31, 240–246.
- Scoones, I., Stirling, A., Abrol, D. et al. (2020). Transformations to sustainability: Combining structural, systemic and enabling approaches. *Current Opinion in Environmental Sustainability*, 42, 65–75. <https://doi.org/10.1016/j.cosust.2019.12.004>
- Vogel, C., & O'Brien, K. (2022). Getting to transformation: A social science research agenda for the 21st century. *Current Opinion in Environmental Sustainability*, 55, 101152. <https://doi.org/10.1016/j.cosust.2022.101152>

Statement on data availability

The data used to produce this report includes information from case studies' TCSs planning documentation (internal), SoE documentation reports (internal), Validation Workshop documentation reports (internal), and the Transformative Change Stories compiled by case study teams. These documents are accessible to all project members through the internal data repository on SharePoint.

As some of the workshop documents contain sensitive information, the decision on open access availability (potentially in an adapted form) rests with the respective case study teams. The TCSs files are made publicly available via Zenodo.

Statement on ethics

This report includes information gathered through the Systematisation of Experience and Validation Workshops conducted in the case studies. In accordance with the General Data Protection Regulation (GDPR) of the European Union (EU), informed consent was obtained from all participants who took part in these participatory workshops of the PLANET4B project. No personal data was shared in the context of this report.

The authors declare that they have no conflicts of interest.

Annex

Evidence base for TCS (Annex 1)

Table 1. Overview of data sources and TCSs generation processes.

Case	Evidence base	Process of full TCS generation ³	References
Inclusive Nature Recreation (Oslo, Norway) NINA & OOF	• Document analysis (municipal planning documents) • Focus group interviews with voluntary outdoor nature recreation organisations (n=6) • Interviews with municipality staff (n=4) • Participatory observations during evening, weekend and weeklong events/camps (n=6) • (Expert) Network meetings and (System mapping) workshops (n=7) • SoE workshop (n=1) • Breakfast seminar (n=1)	Personal TCS stories generated in preparation for the SoE; final TCS story developed within the project team. Project findings discussion and validation through network meetings and a workshop with relevant actors (e.g. health sector, outdoor nature recreation, and disability organisation representatives). Case study outputs adapted into conference and network meeting presentations, booklet, breakfast seminar, and articles.	Gundersen, V., Venter, Z., Vistad, O. I., Junker-Köhler, B., & Wold, L. C. (2025). Children's Nature Use and Related Constraints: Nationwide Parental Surveys from Norway in 2013 and 2023. <i>International Journal of Environmental Research and Public Health</i> , 22(7), 1067.

³ This refers, on the one hand, to the TCS texts included in the Annex of this document. On the other hand, the TCSs go beyond these short narrative stories, as they encompass far more aspects than could be summarised in the brief accounts. These additional aspects and presentations of results are reflected in a variety of further outputs (see Table 1), which are likewise based on the TCSs.

Urban Youth & Nature (Erfurt, Germany) CGE & MLU	• System mapping workshops (n=4) • Youth workshops & interventions (n=4) • Piloting of Pathbreak: A Biodiversity-Food-Governance Game (9 sessions) • Interviews with LC participants (n=8 ex post) • Ongoing supermarket experiment (n=300 survey, n=300 field experiment including 178 rejections and 132 completions) • Ongoing fashion experiment (target n=200 students)	Story co-authored with youth; participatory film; validation via screenings & conference; booklet/leaflet	Youth for biodiversity leaflet. Soliev, I., Pajak, M., Bykova, M., Janssen, M.A. (in preparation). Pathbreak: A Biodiversity-Food-Governance Game. Soliev, I., Pajak, M., Bykova, M., Janssen, M. (2025). Pathbreak: A Biodiversity-Food-Governance Game. Soft and hardware infrastructure for a simulated serious game, available at www.pathbreak.eu. Grüner, S., Jäger, J., Bykova, M., Soliev, I. (in preparation). Role of social norms and affection around biodiversity in food purchase behavior: A survey and field experiment. Grüner, S., Jäger, J., Bonetti, M., Villa, M., Soliev, I. (in preparation). Role of social norms and affection around biodiversity in fashion consumption attitudes: A survey experiment.
BEST Graz – Bio-/Diverse Edible City (Graz, Austria) IFZ & FUG	• Analysis of municipal policy documents • Interviews with women* gardeners (n=7 ex post) • Stakeholder interviews	Story: compiled by IFZ & FUG team; feedback from advisors. Film: Co-creation with women's group and advisory board members; draft	Krause, Mirjam, Thaler, Anita, Santer, Katharina, Karner, Sandra, Seliger, Christina & Steinwender, David (2024). Sowing change: A women*'s garden as queer-feminist intervention

	(n=19) • System mapping workshops (n=5); SoE workshops (n=4) • Pilot garden intervention (weekly over 9 months) • Validation workshop (n=1) • Facilitators' reflection protocols	shared with participants for feedback. BEST Graz Policy Dossier: content co-created with policy LC; validation of draft with policy LC & feedback from advisory board.	in biodiversity research. Queer-Feminist Science & Technology Studies Forum, Vol. 9, December 2024. Steinwender, David, Karner, Sandra & Thaler, Anita (2025 forthcoming). Gaia women* garden: Co-Creating a space for transformative learning on bio-/diversity. In: Getzinger, G., Jahrbacher, M., Prună, R. (eds) Critical Issues in Science, Technology and Society Studies – Conference Proceedings of the 23rd STS Conference, Graz 2025. Steinwender, David, Thaler, Anita & Karner, Sandra (2025 forthcoming). Community-Lernerfahrungen aus dem GAIA Frauen*garten. Magazin erwachsenenbildung.at, Vol. 56 Thaler, Anita & Karner, Sandra (2024). Can participatory action research deepen the understanding of intersectionality in the field of biodiversity research? In: Carmen-Pilar Marti Ballester (ed.). Proceedings of the 7th International Conference on Gender Research, Barcelona. 378–387.
--	--	--	---

Ethnic Minority Communities & Outdoor Access (United Kingdom) DC & CU	• Interviews (n= 13) • Testimonies (WhatsApp group) • Biodiversity “cupboard” exercise • Learning Community workshops (5 Face-to-face & 2 online) • System Mapping workshop (n=1) • SoE workshop (n=1)	Participatory film & infographics developed with Learning Community; validation via community-led review.	Lyons, C. et al., (in preparation) Creative Methods for Biodiversity Governance: A Critical and Inclusive Approach to Participatory Learning. Book Chapter submitted to No Limits to Hope. Club of Rome.
Religion & Agro-Biodiversity (Switzerland) FiBL	• Interviews with farmers (n=22) • Community events (n=2) • Photo exhibition (n=4) • System mapping workshops (n=2) • SoE workshop (n=1)	Co-creation of photo exhibition; church/community presentations; podcasts; feedback from participants.	Sabir, G., Tennhardt, L. M., & Home, R. (2025). Heaven and earth: a systematic review of theories on the relationship between religion and environmental behaviour. <i>Discover Sustainability</i>, 6(1), 178. Faith and Farming: Swiss farmers’ perceptions about their religious and spiritual beliefs and biodiversity-related farming behaviour (Submission pending next week September 22–26, 2025)
Agrobiodiversity & Seeds (Hungary) ESSRG	• Desk research • Policy analysis • Interviews (n=21) • System mapping workshops (n=1) • Observation of seed savers’	Infographics & story map co-created with seed network; webinars for validation with SB; feedback from members of the Magház Association (practitioners).	Rusvai, M., Pataki, G., Lipka, B. Swapping Multispecies Knowledge – Interconnectivity of Seeds and People in Garden-scale Agrobiodiversity (in preparation).

	practices • Magház network workshops • Validation Workshops (n=2, online)		
Trade & Global Value Chains (EU & Brazil) RU	• Desk research (EUDR, CSDDD, CAP, Soy and Beef global supply chains) • Expert interviews (n=31) • System mapping workshop (n=2) • Validation workshop (n=1, F2F)	Policy presentation & teaching materials: validated with SB; outputs tailored to policymakers & schools; fieldwork and co-production of video with local communities in Brazil, and vide screening & debate in the Netherlands.	Mendes, V., Inoue, C. Y. A., Søndergaard, N., & Tavares, N. (2025). Intersectional Environmental Justice in Dutch-Brazilian Beef and Soy Trade: Challenges for the EU Regulation on Deforestation-Free Products. <i>International Journal of the Commons</i>, 19(1). Inoue, C. Y., & Mendes, V. (2024). Connecting Life on Land (SDG 15) with Planetary Justice in the Amazon. In <i>The Quest for the Sustainable Development Goals: Living experiences in territorialising the 2030 Agenda in Brazil</i> (pp. 169–179). Cham: Springer International Publishing.

Guiding questions for the preparation of Transformative Change Stories (Annex 2)

a) Intensive, place-based Transformative Change Stories

- Do you already have an idea about what you want to convey in your story? Do you have specific key points or messages you would like to focus on?
- How did/do you (plan to) generate the content of your stories?
- How does this refer to your system map, leverage points, desk work, policy analysis, etc?
- Through which channel(s)/in which setting do you plan to communicate your story (interactive event, meeting, presentation, performance, online channel(s), etc.)?
- Would you happen to know of inspiring story examples beyond PLANET4B? (Please add references/links if available.)
- In what respect do you expect your Systematisation of Experience to contribute to the story?
- What would you like to achieve with your story? What kind of outputs would you like to generate?
- To whom are you planning to address your Transformative Change Story?
- What specificities (language, format, timing, etc.) should you consider concerning your target group(s)?
- In which format shall your story be told (booklet, flyer, guidance document, video or other type of film, theatre, fairy tale, exhibition, game, etc.)?
- Do you have expertise or experience in implementing this format?

b) Extensive, sector-based Transformative Change Stories

- Do you already have an idea about what you want to convey in your story? Do you have specific key points or messages you would like to focus on?
- How did/do you (plan to) generate the content of your stories?
- How does this refer to your system map, leverage points, desk work, policy analysis, etc?
- Through which channel(s)/in which setting do you plan to communicate your story? (interactive event, meeting, presentation, performance, online channel(s), etc.)
- Would you happen to know of inspiring story examples beyond PLANET4B? (Please add references/links if available)
- What is the specific goal of your “validation workshop”?
- What would you like to achieve with your story? What kind of outputs would you like to generate?
- Have you started to plan the validation workshop? (timing, content, setting, design)
- Do you wish support for the workshop design?
- To whom are you planning to address your transformative change story?
- What specificities (language, format, timing, etc.) should you consider concerning your target group(s)?
- In which format shall your story be told? (booklet, flyer, guidance document, video or other type of film, theatre, fairy tale, exhibition, game, etc.)
- Do you have expertise or experience in implementing this format?

Guidance on Transformative Change Story (Annex 3)

To close WP3 activities, instead of a long summary report of what has happened in the cases, we opted for a collection of Transformative Change Stories to offer engaging narratives to key actors on how they could make their first steps towards transformation. We prepare these stories to generate understanding, increase motivation, overcome barriers and foster behavioural and institutional change in localities and at broader scales. Our stories should reflect on, and build from, the co-creative process we went through in our case (incl. interviews, LC and SB workshops, the launched interventions and their observed impact, etc.). But instead of looking like a boring research report, we expect the Transformative Change Stories to be exciting, to target specific audiences, and to offer new visions and opportunities on how to achieve those visions.

The format and the exact content are to be decided by case leaders. However, there are a few main components that should be present in every transformative change story:

- **Problem statement:** What is the issue at hand? What was the starting point, the core problem you aimed to solve (or at least to better understand) when starting PLANET4B?
 - **Previous research outputs to use:** summary of your first workshop with your LC or SB on learning objectives, interviews with stakeholders (if any), lit review results, intersectionality workshops.
- **Vision:** How will the studied locality or sector look after the transformation has happened? What can/should be transformed (personal values and behaviour, intrapersonal (community level) actions, or institutional rules, or a mix of these)?
 - **Previous research outputs to use:** visions presented in the Nijmegen workshop, systems diagrams and broader impacts from the T3.2 workshops, SoE and validation workshop results
- **How to achieve this vision:** How did transformation happen in your case, which can be a model for others? What were the significant elements supporting this transformation?
OR:
How and why did transformation NOT happen in your case, i.e. what barriers need to be broken, or what lock-ins need to be removed to achieve transformation?
 - **Previous research outputs to use:** summaries of the leverage points workshop, results of the SoE and validation workshops. Results (and assessment of results) of the interventions.
- **Evidence base and further readings:** what data/evidence did you use to produce the above detailed story? Are there any other related materials one can read/access? Here, you can refer to the literature review, the interviews, the workshops carried out, or the interventions launched. Plus, if you have prepared anything else (e.g. if you wrote a policy brief on top of the transformative change story, or if you had conference presentations which are online available, you provide links to those).

Enabling intersectional nature recreation and biodiversity stewardship for urban resilience (Annex 4)

Story of Transformative Change: Enabling intersectional nature recreation and biodiversity stewardship for urban resilience (Greater Oslo, Norway)

Authors: Tuva Beyer Broch, Alexander Engen Aas-Hanssen, David Barton, Helene Figari, Johan Hval, Vegard Gundersen, Yennie Bredin, Reidun Bolsø

Introduction

Within the PLANET4B project, the Norwegian case explores how to enable outdoor recreation activities across a broader range of individual (dis)abilities, while simultaneously promoting stewardship and safeguarding local biodiversity. This work takes place on both macro and micro levels, combining analysis of planning documents and interviews with municipal planners responsible for mapping of recreational areas in Oslo (M98), collaboration with practitioners in the field of disabilities, outdoor recreation centres, and field studies involving children, youth, and parents in outdoor settings.

The project has included interviews with stakeholders, dialogues and workshops with individuals who have pivotal personal and/or professional expertise when it comes to living with different forms of disabilities. It has also involved document analysis and participant observation during outdoor recreation camps and outings for children and youth with (dis)abilities. Throughout this process, both researchers and project partners have undergone transformative experiences and have also observed such transformations among the participating children and youth.

This text will focus on one particular story – that of Reidun Bolsø and the organisation she leads, the Greater Oslo Recreation Council (OOF) – which illustrates a nesting of diverse experiences of change across a spectrum of intra-, inter-, and institutional transformations that have taken place within the broader context of the project.

Contextualisation

According to the UN, urban women, children, the elderly, and people with disabilities are especially dependent on safe, inclusive, and accessible green spaces for a healthy life (Daniel, 2015). In Norway, children's outdoor activity has become more adult-organised, with increasing social disparities in access to nature, especially since the COVID-19 pandemic (Skår et al., 2016; Gundersen et al., 2024). Research shows that organised outdoor recreation in Oslo often excludes children and youth with disabilities (Remmen & Iversen, 2023).

This is where Reidun plays a crucial role in the Norwegian case, as OOF is part of this statistic. OOF is an umbrella organisation for both outdoor activity organisations and nature conservation, and, like many others, lacked structured ways to include people with disabilities in outdoor activities. As a former municipal planner, Reidun had long wished for a comprehensive and long-term strategy with a goal-oriented approach to universal design of outdoor recreation areas. She brought a desire to systematically map local and regional needs, reach consensus on overarching and achievable goals, improve access to information, and understand geographical disparities. At the same time, she expressed a sense of unease, primarily about how to address individuals and

groups appropriately, and whether she had done enough to facilitate the process. As she put it herself: the fear was less about failing broadly, and more about using the wrong terms or not quite reaching the “gold standard” of inclusion.

A turning point came during an expert network meeting involving people with lived experience of disability. Reidun was struck by how limited her “toolbox” was. Participants shared stories of sleeping in hammocks or igloos, and how adaptations could expand rather than limit opportunities. Instead of focusing on barriers, the conversation opened her mind to possibilities. She left the meeting inspired to create a guidebook for outdoor activity leaders – not just to avoid mistakes, but to think differently.

PLANET4B also introduced OOF to new networks and dialogues, and OOF invited NINA into theirs. One such sharing of network was a meeting with “Discover the Neighbourhood” where common challenges and opportunities across sectors (sport and skiing association, the Norwegian Directorate of Health, municipalities, outdoor recreation organisations, and public health contacts in municipalities) became evident. These collaborations shifted OOF’s strategy on the development of an outdoor centre from broad ambitions to specific and inclusive action. The project helped reduce Reidun’s fear of “getting it wrong” and replaced it with a drive to listen, learn, and do better. As a result, she has now proposed including disability more explicitly in OOF’s strategy and considered bringing relevant interest groups in as members. PLANET4B gave both her and OOF the confidence and connections to move from intention to change – creating new momentum for inclusive outdoor recreation.

Vision and experiences with collaboration across fields/different backgrounds

All researchers involved in the Norwegian case study shared Reidun’s initial uncertainty around how to approach questions of (dis)ability in outdoor recreation. Like Reidun, the researchers experienced genuine shifts in perspective through participation in network meetings, interviews, and fieldwork. These encounters revealed how essential it is to establish early and ongoing dialogue between researchers, practitioners, users, and other stakeholders. A shared understanding of the project’s purpose, and a common language grounded in mutual respect, proved crucial for creating a sense of equality across sectors and backgrounds.

Transdisciplinary collaboration requires time and care. Building trust and developing the ability to “translate” between institutional, organisational, and experiential knowledge is a continuous process. Through this case study, OOF has significantly expanded its knowledge base in an area where it previously had limited expertise. As a result, they have initiated new dialogues and collaborations between users and member organisations, such as the Association for Young People with Disabilities, and has provided feedback to the municipal mapping of outdoor areas (M98).

We conclude this section with a quote by Reidun that illustrates how a vision during the project period was turned into a concrete goal and action:

“I ended up thinking that OOF has the tools to make change locally and potentially nationally too. I suggested for my board leader that we include the disabled in our strategy, and I now think that we ought to recruit some from the interest group as members of our organisation”.

How to achieve the vision

The collaboration between NINA and OOF in PLANET4B has generated a number of practical lessons relevant to similar initiatives. We offer the following recommendations to the wider project team and to other transdisciplinary projects:

- **Cross-Sector Collaboration:** Building stronger ties with interest organisations and working systematically with (dis)ability issues across interest organisations and municipalities has proven essential. In addition, we observed a need for closer collaboration between outdoor recreation NGOs and professionals specialising in facilitation and disability inclusion.
- **Policy Development:** We now see the need for a clearly defined strategy that addresses barriers to outdoor recreation for all groups, including people with disabilities. This involves concretely integrating disability as a priority in their overarching policy framework.
- **Capacity Building:** We have identified the need for internal training and the development of accessible, user-friendly tools (e.g. fact sheets) to ensure that outdoor activities are adaptable to the various needs and potentials across groups and individuals, particularly children and youth with disabilities.

None of the above recommendations would have come forth if not for the close collaborations and dialogue between the research team, practitioners, individuals with different forms of disabilities and expertise, as well as being out there in the field observing and taking part in activities and conversations.

Further readings

Aas-Hanssen, Alexander Engen (2024). Friluftsliv (outdoor life) for all: Outdoor recreation organisations' perspectives on inclusion of children with disabilities in Friluftsliv (Master's thesis). University of South-Eastern Norway. <https://hdl.handle.net/11250/3174246>

Barton, D. N., Zolyomi, A., Franklin, A., Aas-Hanssen, A. E., Motschiunig, A., Thaler A., Smith, B., Junker-Köhler, B., Loučková, B., Lipka, B., Inoue, C. Y. A., Steinwender, D., Simsek, E. T., Kelemen, E., Ludhra, G., Brown, G., Sabir, G., Pataki, G., Figari, H., Soliev, I., Czett, K., Tennhardt, L., Bonetti, M., Bykova, M., Ofori-Amanfo, P., Navarro Gambín, P., Chudy, R., Home, R., Karner, S., Vaňo, S., Ludhra, S., Gundersen, V., Mendes, V., & Bredin, Y.K. (2024). Transdisciplinary diagnostic framework for biodiversity decision-making assessment. Report No D1.7 of the Horizon Europe Project 101082212 – PLANET4B. Brussels: European Research Executive Agency. DOI: 10.5281/zenodo.15303298.

Available at: <https://planet4b.eu/project-documents/transdisciplinary-diagnostic-framework-for-biodiversity-decision-making-assessment/>

Youth4Biodiversity (Annex 5)

Story of Transformative Change: Urban Youth, Germany

Authors: Mariana Matoso and Maryna Bykova

Problem Statement:

This case study explores the critical issue of youth empowerment in biodiversity prioritisation, focusing specifically on urban young people, many of whom live at the intersection of multiple forms of marginalisation – such as being newcomers, migrants, or part of international communities.

Implemented within the broader framework of the PLANET4B project, funded by the European Commission, our intervention aimed to understand and respond to the lack of youth representation in biodiversity and nature-related decision-making. Research shows that many young people – especially those from less privileged backgrounds – feel powerless when it comes to influencing environmental policy or contributing meaningfully to sustainability governance (Hickman et al., 2021; Wu et al., 2020). This sense of disconnection is often compounded by barriers to civic participation, such as migration status, language limitations, and experiences of discrimination or exclusion, especially in regions with more substantial support for far-right politics.

In this context, we established a Learning Community (LC) in Erfurt, Thuringia (Germany) – a city located in a federal state where youth, especially internationals and newcomers, may face heightened risks of marginalisation. Coordinated by Culture Goes Europe (CGE) e.V., a local NGO with two decades of experience in youth activation and non-formal education, the Learning Community was designed as a safe, inclusive space for reflection, co-creation, and action. Together with researchers from Martin Luther University in Halle and in cooperation with local partners, we implemented a series of participatory workshops, nature-based interventions, and community-engagement tools.

The core problem we sought to address was twofold:

1. To what extent do young people – especially those with less privilege – feel empowered to influence biodiversity and nature prioritisation in decision-making?
We approached this question using empowerment theory (Zimmerman, 2000), distinguishing between empowerment as a process (e.g. learning decision-making skills, gaining access to networks) and as an outcome (e.g. increased self-efficacy, critical awareness, leadership, policy influence).
2. Can specific intervention methods – experiential learning, behavioural games, and creative or deliberative activities – foster empowerment among youth and contribute to stronger biodiversity engagement?
This involved testing participatory, hands-on approaches inspired by non-formal education and experiential learning theory, with an emphasis on peer learning, nature connection, and systems thinking.

Our interventions were strongly aligned with European policy frameworks, particularly:

- The GreenComp framework (2022), which emphasises holistic sustainability competences including empathy, responsibility, systems thinking, and action;

- The European Commission’s “Evaluating the Impact of Nature-Based Solutions” guidance, which advocates for integrating social metrics – like well-being, cohesion, and participation – into conservation impact assessments.

Throughout the intervention, biodiversity served as a common ground, transcending social and linguistic differences and fostering a sense of belonging. The Learning Community functioned not only as a space for ecological awareness but also as a platform for horizontal relationships, collective empowerment, and youth-led experimentation with real-world change.

By exploring how interventions such as the Youth4Biodiversity package and other outdoor educational methods could drive transformation, this case study contributes to a deeper understanding of how empowerment, intersectionality, and inclusion intersect with biodiversity policy – and how local youth, when given the right tools and trust, can help shape greener, more just futures.

Vision:

In our vision, the locality of Erfurt – and similar urban contexts – emerges as a space where biodiversity is no longer a distant concept, but a shared value within the social fabric of everyday life. Transformation in this setting is not limited to ecological outcomes – it also reshapes personal attitudes, collective behaviours, and institutional norms.

Our Learning Community journey revealed that fundamental, lasting transformation requires change on multiple levels:

1. Personal & behavioural transformation – young people begin to:

- Actively participate in biodiversity-related activities – from joining citizen science projects to initiating local clean-ups;
- Adopt sustainable lifestyle practices, such as reducing single-use plastics, supporting biodiversity-friendly products, or rethinking food choices;
- Move from passive concern to active advocacy, organising or joining environmental campaigns, workshops, and public actions.

2. Attitudinal shifts – Transformation is also internal and reflective. Youth develop:

- A deeper understanding of biodiversity issues, particularly in the urban context;
- A renewed sense of personal responsibility and emotional connection to local ecosystems;
- An increased willingness to speak up, influence others, and engage in dialogue with decision-makers and institutions.

3. Community-level change:

- The interventions foster stronger peer relationships, promote intercultural understanding, and create inclusive spaces for shared learning and collective empowerment. Youth start to co-lead initiatives, reshaping community narratives around biodiversity and sustainability.

4. Institutional influence:

- As empowered actors, youth challenge existing decision-making structures and seek more inclusive, responsive governance. We envision:

- i. Institutional openness to youth participation in biodiversity planning;
- ii. Uptake of co-created educational tools (e.g. the Biodiversity-Food-Governance Game) into formal and non-formal settings;
- iii. Policy shifts that recognise youth as legitimate stakeholders in shaping urban ecological futures.

Path to transformation:

Following the methodology outlined in the PLANET4B framework, the Learning Community collaboratively developed indicators to detect and monitor change, ensuring that impact was not just aspirational but measurable. Through a series of participatory and immersive interventions, they laid the foundation for a transformative trajectory.

How to achieve this vision:

The transformation we envision – where young people become empowered biodiversity advocates – did not happen by chance. It emerged through intentional design, trust-based facilitation, and immersive, co-created interventions that allowed participants to learn, feel, and act. The following elements were central to achieving this change and can serve as models for others seeking to foster similar outcomes.

Participatory and experiential interventions

The Biodiversity-Food-Governance (BFG) Game

The BFG Game served as a dynamic simulation tool that connected abstract policy dilemmas to personal values and group decisions. Participants navigated trade-offs, experienced emotional reactions, and reflected on the real-world implications of their choices. This created space for both systems thinking and emotional resonance. The game was especially impactful because it:

- Encouraged critical discussion around governance, consumption, and sustainability;
- Worked across formal and non-formal educational settings;
- Created space for youth to practice decision-making, negotiation, and empathy.

Participants reported the game as a highlight, fostering both cognitive understanding and emotional engagement. If adapted and scaled, it holds promise for influencing youth workers, teachers, and even policy discussions.

Forest retreats and nature immersion

Activities such as camping, forest walks, and overnight retreats became powerful moments of embodied learning. These immersive experiences:

- Activated multisensory awareness, from silent hikes to barefoot moss walks;
- Blurred traditional roles between learners and facilitators;
- Allowed young people to form emotional bonds with each other and with nature.

These "learning by doing" interventions strengthened participants' ecological empathy, resilience, and reflection. They also brought biodiversity challenges to life – turning abstract concepts into lived realities.

The outdoor cinema

This community-centred intervention leveraged film as a trigger for public learning. By showing biodiversity-themed films in an outdoor setting, it bridged the gap between leisure and education, attracting eco-enthusiasts. Participants appreciated the low-threshold format, especially for newcomers to environmental topics. Its potential for replication is high, particularly if adapted to local cultures and contexts.

Hikes as connection-builders

Hikes through Erfurt's green spaces created a gentle, welcoming entry point for engagement. They supported:

- Mental and physical well-being, particularly for migrants who feel isolated;
- Community-building and cross-cultural friendships;
- Deepened awareness of urban biodiversity.

The hike model is easily replicable and offers a low-cost intervention that combines health, education, and civic engagement.

Creating conditions for empowerment

Beyond the activities themselves, transformation was made possible through intentional design choices that prioritised ownership, inclusivity, and care:

Co-creation and ownership:

Participants helped design, lead, and evaluate the activities. This shifted the power dynamic from passive recipients to active co-creators. Taking responsibility for tasks – whether cooking on retreat, guiding discussions, or facilitating sessions – fostered a deep sense of agency and confidence.

Relational learning and emotional safety:

Trust, empathy, and informal connection were integral. Participants cited emotional openness as a key enabler: "You don't need to be an expert – just being present and heard can be transformative."

Horizontal facilitation:

Learning was peer-led and inclusive. Expertise came from lived experiences, not titles. Participants became "situated experts," especially those who initially felt unqualified to speak about biodiversity.

Recognising systemic barriers and enablers

Transformation did not ignore structural realities. Participants shared how:

- Germany's infrastructure for sustainability (e.g. public recycling, organic food access) enabled behaviour change;
- In contrast, systemic barriers in their home countries or communities limited what they could replicate;
- Eco-anxiety and overwhelm were real and needed space for processing.

Recognising these structural differences allowed the Learning Community to contextualise impact and design for inclusion.

What have we learned?

The Learning Community experience, along with the interventions it offered, provides valuable lessons for those designing learning interventions, particularly in the fields of biodiversity, sustainability, and youth empowerment. These insights are not just about what worked – but why it worked – and how similar processes might be adapted, scaled, or reimaged elsewhere.

1) Immersive experiences work

One of the clearest lessons from our Learning Community is that immersion fosters transformation. By designing experiences that activate different senses and dimensions of our humanity – emotional, intellectual, social, and physical – we increase the likelihood of creating meaningful, lasting connections to biodiversity.

This is the strength of package interventions: they combine varied learning tools (games, hikes, cinema, reflection, role-play, shared tasks) into a coherent, experiential journey. These diverse formats allow people to find what works best for them, offering multiple entry points into the topic.

Biodiversity is diversity. Learning about biodiversity must also reflect this. There is no one-size-fits-all.

2) Context matters

Placing participants in environments where sustainable choices are not optional but necessary – such as rustic camping settings or remote hikes – bridged the gap between theory and practice. Minimalist conditions encouraged collaboration, creativity, and problem-solving, while nature immersion reinforced a personal connection to the ecosystems we aim to protect.

Transformation happens when values and behaviors are tested, embodied, and practised – especially outside the comfort zone.

3) Ownership enables empowerment

Participants were not passive recipients of knowledge but co-creators of the journey. They helped shape community norms, lead discussions, organise logistics, and reflect collectively. This agency reinforced their sense of belonging, purpose, and competence.

By shifting the power dynamic – allowing young people to take initiative, experiment, and lead – we created a space where confidence and critical thinking could flourish. Empowerment became a process and an outcome.

4) Design for emotional and relational learning

Emotions are not side effects of learning – they are central to it. The Learning Community thrived on emotional safety, mutual support, and openness. From informal chats to deep personal reflections, participants consistently cited relationships and feelings as key to their engagement.

Facilitating horizontal, caring, and inclusive spaces helped counteract the powerlessness many felt as migrants or young people in systems where they are

underrepresented. This created an environment where both eco-anxiety and hope could be voiced and processed.

5) Structure with flexibility

The most effective interventions strike a balance between intentional design and sufficient flexibility to meet participants where they are. Not everyone wants to speak in a group, hike all day, or lead an activity. Our success came from offering a spectrum of participation, from quiet presence to facilitation.

Learning spaces should not force transformation – they should enable it through choice, rhythm, and responsiveness.

What can we do with this?

Scale and replicate in new ecosystems

Nature-based interventions should not be limited to specific regions or demographics. They can and should be replicated across diverse ecosystems, ensuring accessibility to both urban and rural youth. Programs like Youth4Biodiversity (package intervention) can serve as blueprints – adaptable, inclusive, and impact-driven.

Integrate into formal education

Outdoor, experiential learning belongs in schools. By embedding immersive, reflective, and community-based activities into the formal education system, we can reach broader audiences and equip future generations with the mindset and tools to prioritise biodiversity. This also means training educators in facilitation methods and offering them adaptable resources like the BFG Game, forest retreat models, or biodiversity cinema packages.

Advocate for policy and structural change

Transformation must be supported by enabling environments. We need to:

- Advocate for local and national policies that fund experiential environmental education;
- Ensure youth engagement is not tokenistic but embedded in decision-making processes;
- Share our impact evaluation and success stories with funders, institutions, and networks to build the case for more support.

Conclusion:

What made change possible was not just the content, but the container. The Learning Community functioned as a social and emotional ecosystem, allowing participants to co-own their learning, explore their roles in ecological systems, and envision agency where they had previously felt powerless. In a region marked by political polarisation and rising discrimination, this inclusive and pluralistic space was itself a quiet act of resistance – and a powerful one.

Transformative change in this context meant:

- Moving from feeling like an outsider to becoming an agent of change;
- Shifting from abstract concern to embodied action;

- Reframing biodiversity not as a scientific concern alone, but as a deeply human, social, and ethical one.

The outcomes of this journey – documented through interviews, reflections, and shared stories – highlight that transformation does not follow a linear path. It is cultivated through layered, relational processes that honor personal context, enable experimentation, and support emotional connection.

Evidence base and further readings:

To dive deeper into the Youth4Biodiversity initiative and explore the full scope of its transformative impact, we invite you to read our dedicated [blog post](#). In this post, you'll find the complete Youth4Biodiversity leaflet, which outlines the structure of the package intervention, the theoretical and methodological background, the detailed activities, evaluation indicators, and our key results and recommendations.

This package intervention provided an immersive learning experience in the Leutratal Natural Reserve in Thuringia, Germany. Using experiential and outdoor education methods, the program aimed to strengthen ecological empathy, foster behavioral and attitudinal change, and promote long-term youth engagement in biodiversity conservation.

The evaluation of the package intervention revealed powerful outcomes:

- The hike fostered a moderate-to-high sense of ecological integration, reinforcing the value of nature-based experiences in stimulating biodiversity awareness.
- The mindfulness session helped participants shift from discomfort in natural settings to a peaceful coexistence with nature, enhancing emotional connection, ecological empathy, and personal well-being.
- The outdoor cinema spurred increased willingness to engage in conservation efforts, highlighted biodiversity's global significance, and reshaped perceptions of environmental threats, particularly in relation to corporate impact.
- Overall, participants reported a stronger sense of belonging to the natural world, a deeper appreciation for non-human intelligence, and greater awareness of ecological cycles and kinship with other species. The experience helped decrease feelings of disconnection from nature and encouraged a less anthropocentric worldview.

These results are a testament to the transformative potential of immersive, co-creative, and nature-based learning journeys. To explore the full story and access our recommendations for future programming and policy, check out the [leaflet](#), [blog post](#), [booklet](#), and [video](#).

Opening Up Nature and the Outdoors to Black, Asian, and Ethnic Minority Communities: How Community-Led Action Is Integral to Reshaping the Future of Inclusive Biodiversity Decision Making in the UK (Annex 6)

Story of Transformative Change: Opening Nature and the outdoors to Black, Asian and ethnic minority communities (Central England, United Kingdom)

Authors: Geraldine Brown, Lindy Binder, Alex Franklin, Barbara Smith, Geeta Ludhra, Subash Ludhra

While the UK today is home to diverse ethnic and religious communities – many of whom hold deep cultural, spiritual, and historical connections to the natural world – mainstream environmental narratives continue to be shaped by a predominantly secular, white, middle-class worldview. These dominant perspectives often marginalise alternative ways of knowing and understanding nature, offering limited recognition of the knowledge, values, and lived experiences of Black, Asian, and other ethnic minority communities.

This dynamic is reflected in the phenomenon of “**green inequality⁴**” – **where access to nature and green spaces is uneven, and communities of colour face systemic barriers such as socioeconomic disadvantage, inequitable urban planning, and the legacy of racial exclusion. With regards to the latter, as the following account illustrates in the context of walking within the English countryside, this underscores how racism and everyday microaggressions** continue to shape who feels welcome, and who does not, in natural spaces. Such dynamics reinforce the **exclusionary and racialised boundaries of the countryside**, complicating efforts to promote **genuinely equitable access to green and outdoor environments**.

If there is a large group and they are predominantly brown-skinned or black, I do anticipate something. There is that element of fear and anxiety in me. I've been on walks where, for example, a group of cyclists said to me, 'are you the Muslim hikers that were on TV?'...or somebody's said... 'I haven't seen you lot around here before' so we are the 'other' (PLANET4B Learning Community participant).

These factors contribute to disproportionately low levels of outdoor recreation, environmental volunteering, and leadership representation within the environmental sector (Martin & Conway, 2025). Importantly, this disparity persists despite increasing political and scientific recognition of nature's vital role in supporting human health and well-being (Díaz et al., 2015).

These inequities do more than restrict access – they fundamentally undermine the inclusiveness and effectiveness of environmental initiatives. In the face of urgent challenges such as biodiversity loss and climate change, collective and equitable action is not optional – it is essential. Without truly inclusive participation, there is a serious risk of inadvertently reinforcing the very injustices that create barriers for

For further information about green inequality see: Anguelovski, I., Connolly, J.J.T., Garcia-Lamarca, M., Cole, H. and Pearsall, H., 2020. New scholarly pathways on green gentrification: What does the urban 'green turn' mean and where is it going? *Progress in Human Geography*, 44(6), 1092–1109. <https://doi.org/10.1177/0309132519881411>

marginalised communities to engage with environmental initiatives, and equally important, that hinder measures needed to open nature and the outdoors to marginalised groups.

‘You cannot protect the environment unless you empower people, you inform them, and you help them understand that these resources are their own, that they must protect them (Wangari Maathai: A Life of Firsts”, p. 1)’.

The above quote by environmentalist and Nobel Peace Prize laureate **Wangari Maathai** underscores the profound connection between **empowerment, ownership, and environmental stewardship**.

This UK-based transformational story weaves together a tapestry of narratives and actions shared by racialised men and women who participated in a case study ‘learning community’, exploring Black, Asian and ethnic minority access to the countryside, conducted as part of the **EU-funded PLANET4B project**. Through a deep analysis of their voices, the research team captured the dynamics identified by Wangari Maathai, underscoring the importance of inclusive, community-rooted approaches in achieving transformative change. Participants’ narratives capture the rich potential to be found when communities have agency in designing and delivering nature-based initiatives. In conjunction with explicating how equity and meaningful community engagement foster the ‘right’ conditions for creativity, co-creation, and the reciprocal exchange of knowledge, this UK case study highlights how strategies that are community-led and/or purposefully set out to engage communities holistically, act as a powerful means of connecting with and understanding nature and biodiversity through more holistic lenses.

To encourage and facilitate a ‘safe space’ for dialogue, a UK-based Learning Community comprising 13 participants was established.

Our Learning Community

The UK Case study involved engaging in an extended period of shared learning and exchange (via the Learning Community) with a group of men and women from a South Asian and African heritage. A recurring theme that emerged from the participants was the significance of Dadima’s CIC in providing them with a ‘safe’ sense of belonging and in motivating and driving action. Dadima’s CIC is a registered community social enterprise, focused on intergenerational community-based nature learning projects. Dadima’s runs free monthly learning walks around key biodiversity and nature themes.

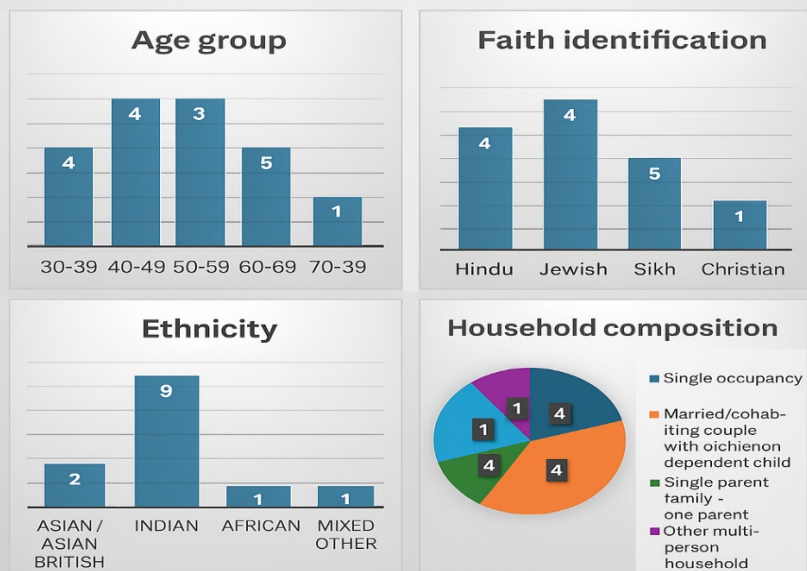
Participants valued the opportunity to share their everyday nature stories and highlighted the need for initiatives that reflect their identities and experiences within the broader biodiversity narrative. Meaningful engagement was seen not only as essential, but also as a vital pathway to action.

PLANET4B

UK Case Study

Learning Community

The UK case study involved working with men and women who identified as from a minoritised community.



No participant reported having a disability

Over 16 months (2024–2025), the Learning Community engaged in a series of creative and participatory engagements designed to surface their nature stories, ways of thinking about nature and biodiversity, and as a space for learning about ways in which they could link experiences garnered from being part of a Learning Community to their everyday lives and actions. This included five in-person and two online workshops, alongside continuous dialogue through a dedicated WhatsApp group. These activities did more than share knowledge – they uncovered hidden narratives about the natural world and brought forward the often-overlooked human, social, and cultural assets within marginalised communities. Working with Dadima’s and a community of walkers revealed deep wells of knowledge, cultural practices, and relational networks that are often overlooked in mainstream environmental efforts.

Group participation centred around a mixture of (five) in-person and online workshops, and an online space using **WhatsApp**. The online space was originally intended to support the coordination of the case study, but it quickly evolved into a dynamic communal learning environment. It became a platform for sharing everyday nature stories, building knowledge around biodiversity-related issues, exchanging ideas, research, and media articles, and maintaining a sense of connection and ongoing communication among participants.

Subsequent (automated) analysis of the WhatsApp group data highlights the power of creating a space that brings people together, creates learning opportunities, stimulates curiosity and introducing new areas of interest:

This WHATSAPP Group conversation shows a close-knit community of nature enthusiasts who support and inspire each other... There is a strong sense of support and celebration within the group... The group share photos and videos of their nature walks and events, creating a sense of connection and shared experiences... Overall, the WHATSAPP conversations showcase a positive and supportive community.

This description aligns with the independent analysis of data collected through a combination of **creative and traditional social science research methods**, including semi-structured interviews, in-person workshops and associated observational notes.

Vision: Addressing Structure and supporting agency

Community-led initiatives are powerful vehicles for telling alternative stories, encouraging curiosity, building confidence, consolidating knowledge, questioning existing structures, and shifting perspectives and behaviours – each essential for driving transformational change. A key message emerging from the PLANET 4B UK case study is a vision of transformational change toward a just and inclusive society – one in which structural inequalities no longer exist to prevent people from experiencing, understanding, or enhancing their relationships with nature. It imagines a future where diverse cultures, traditions, knowledge systems, and the principle of equity are not only recognised, but genuinely celebrated as essential to addressing the biodiversity crisis. In this future, all communities are empowered to engage meaningfully with the natural world, participate in decision-making, and co-create a thriving, biodiverse future (and legacy) for everyone.

Evidence from the UK case study highlights the need to:

- **Celebrate Cultural Diversity in Nature Relationships:**
 - Environmental efforts to promote biodiversity and address issues such as biodiversity loss must respect and elevate the rich, diverse cultural and traditional ties and historical roots that communities already have with nature.
- **Empower Community Engagement:**
 - Communities should feel confident and supported in accessing and enjoying outdoor spaces.
- **Centre Marginalised Voices:**
 - Environmental decision-making must actively include and be led by marginalised groups to ensure inclusive and fair outcomes before and during decision-making processes.
- **Ensure Equitable Access to Resources:**
 - All communities should have fair access to the tools, knowledge, funding, and opportunities needed to participate in nature, outdoor, and biodiversity initiatives.
- **Root Sustainability in Equity:**
 - Sustainability strategies must be based on equitable foundations to be truly effective and inclusive.

Our transformational story is also captured in a **participatory film**, co-created by the Learning Community in collaboration with the research team and an independent filmmaker. The film highlights the importance of **creating safe, humanising spaces** –

environments that are essential for learning, sharing, and building relationships that foster **collective action**.

Inclusion, as this work shows, is not merely about **presence**; it is about **power, voice, and agency**. This case study demonstrates the potential of research when communities are not only learning participants, but also **leaders, educators, and changemakers**.

One member of the Learning Community shared that:

...when we go back home, the decisions that we make, and you know, the rhetoric of biodiversity feeds into the wider community among our friends and family. I think that's quite powerful too, and something that just happened without really realising. Yeah. You know the wider effects.

The opportunities to learn were important. At the beginning of the project, one-to-one interviews were conducted with Learning Community participants. The majority of participants reported that biodiversity was not a term that they were familiar with: As one participant at the start of the project shared:

I think the term itself... if there was a bit more understanding around it, it might help bridge the gap. ...I can't speak for anyone else, but for me personally, until I understand what it means it's difficult to sort of comprehend what it means. So I mean, I guess it's just it's just a term. there needs to be a bit more understanding of what it is.

Collaboration with Dadima's: Community-led initiatives as catalysts for change

The collaboration with Dadima's CIC illuminated the rich human, cultural, social, and community capital embedded within community-led initiatives. These initiatives are active agents of change, essential to shaping more inclusive and effective responses to environmental challenges, such as biodiversity loss.

'I was told to be careful of mixing with people because if I get an infection or something, then my surgery would be put behind. However, the Secret Gardens and Stacy's Garden were just everything I needed to go through. It was the perfect ending to what was to come, which would have been hibernation, but the weather was beautiful, and the people were incredible. The whole experience felt like a gift from nature. And, I felt if it wasn't for this group, I wouldn't have been there, obviously. And today, I had a really difficult choice of – do I be here or not? Because my nephew turned 16 and is having a big do. We've never not been at a kid's big, big party. I said to [names Dadima's lead], if I come, I have to leave. But if I do this ...and I just decided, no. Actually, this is for me!'

Our findings also reveal the many ways in which Dadima's acted as a conduit for connecting people with nature across generations. The stories shared by members of the Learning Community speak to the depth of intergenerational connection, cultural and historical resonance, and emotional well-being that community-led experiences in nature can foster. As was shared by one of the leads for Dadima's, reflecting on the experience of one of their own family members during a recent Dadima's nature walk:

‘This felt like a pilgrimage walk. He enjoyed seeing the red kites glide and was taken away by the breathtaking views. He loved watching his three-year-old great-granddaughter run, play, dance, and sing nursery rhymes in nature, pick daisies, and style them in her hair. It felt so special celebrating our oldest family member’s birthday in the Chilterns countryside...’.

As this recount reflects, this was not just a walk; it was a reclamation of belonging, of intergenerational joy, of cultural connection in a place where many had felt invisible. At the core of this work lies a vital message: equity must be central to any meaningful and sustainable action on biodiversity, and this needs to be planned for from the outset. Recognising and resourcing community leadership is not only a matter of justice – it is essential for achieving lasting and impactful environmental outcomes.

Transforming Self, Transforming Society: The Role of the Individual

Another important message emerging from this work is the critical need to build **trust** and prioritise **equity and inclusion** through engagement rooted in an **ethics of care approach**. Respect is the foundation of meaningful community involvement, enabling the co-creation of knowledge that not only inspires action but also helps drive systemic change. This approach is essential for addressing urgent challenges such as **biodiversity loss** and for advancing broader goals of **environmental justice** and **sustainability**.

During one Learning Community workshop, a member of the learning community shared that his engagement in the project prompted a process of reflection, leading to the demystification of ideas he had previously associated with tackling issues such as biodiversity loss.

‘So, there was that tension. I need to commit time to this because it is so important, but there was the barrier of time and prioritising it. Why should we do it? It was me. The barrier was really thinking about why I need to prioritise this. Why does it need to move up on my personal agenda? And how can I do it? It made my barrier, and I didn’t know what I could do to improve biodiversity. I didn’t realise it would be this simple – so straightforward. I was overthinking it, thinking too big. I thought I couldn’t do it on a smaller scale’.

Empowerment Through Action: Implementing measures that aim to engage with communities and connect them with nature meaningfully

Through this UK-based case study, we see that change **for participants in the Learning Community begins at the micro and local level**. When communities have a sense of belonging, able to lead, share, and shape their environmental futures through connecting with nature, the resulting actions are more just, more meaningful and inclusive, and ultimately more sustainable.

Back to those old values that you have to give back. For us, Dadima's reminds us of those values of being selfless... we have a duty to build community, and if everybody does that, we will be a better world.'
(Learning Community participant)

For another participant, engagement encouraged her to reflect on growing up in Africa and how she has started to notice things that she had once taken for granted:

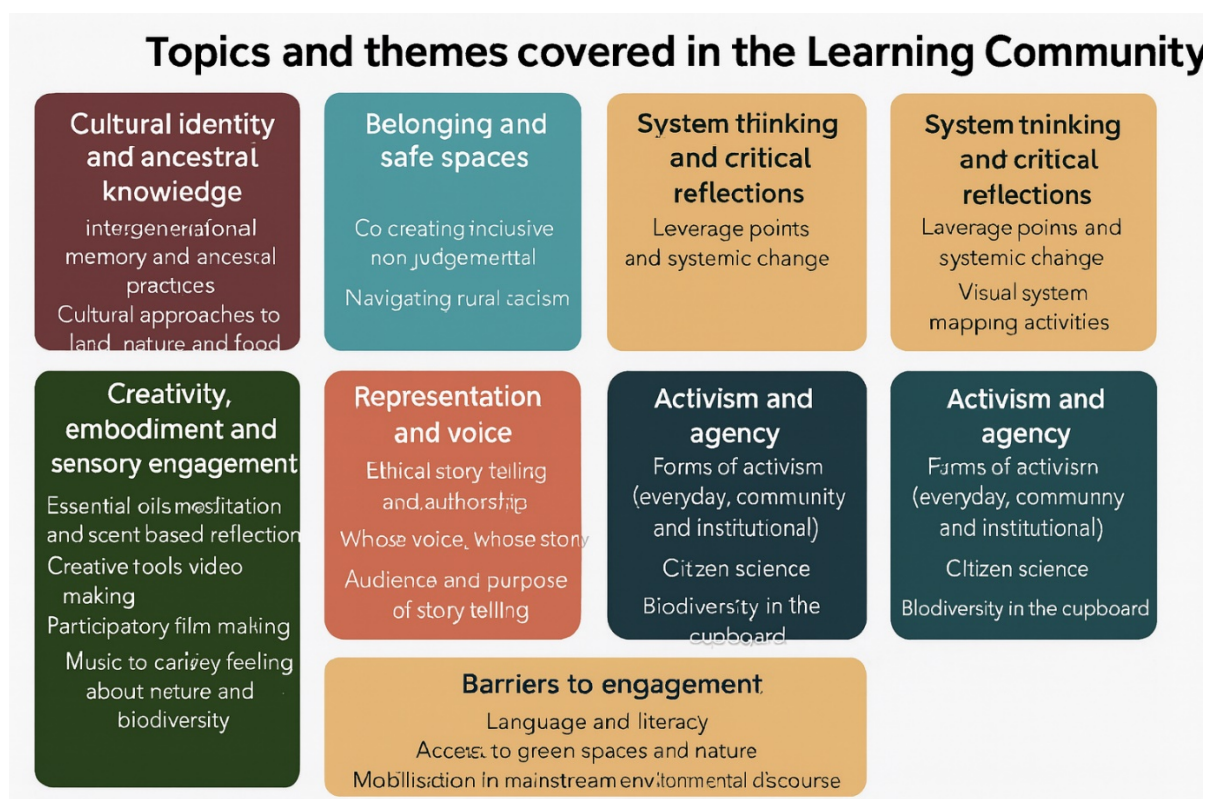
'I think what it is led to me is also noticing, we've got an area where we do barbecues and we lay down and chill and stuff, and then we've got a place, a place where we, you know, we do gardening like, there's always vegetables. So we always, I grew up on fresh vegetables every day and I took it for granted. But when I went, I saw my mum's – been doing more biodiversity itself, because where we sit and relax previously it was just trees to provide shade. But, she's changed all those trees to fruit trees. She's got herbs growing there. There's lemongrass. So, it's amazing that this space, where you can just chill every season, has something growing in it that you can eat and put into food, a...I think something which I picked out is that it's about how nature feeds us and I had not thought about it ... I had time'.

By prioritising trust, care, and equity, we can reimagine environmental policy and practice to reflect the rich cultural diversity in UK society – and ensure that everyone understands and sees themselves as having a role to play in reducing biodiversity loss and stewardship of the natural world. A pathway to this rests on working with communities and the community sector. Notably, however, it also rests on resourcing and supporting communities and community-led organisations to lead and sustain such grassroots environmental initiatives.

Meaningful engagement in biodiversity initiatives requires a shift from 'deficit-based' to 'strength-based' approaches; seeing communities as assets, rather than mere beneficiaries, is foundational to building inclusive and effective environmental strategies. For these strategies to be truly transformative, they must:

- Actively involve communities in the co-design and implementation of solutions, not just consult with them as part of a lip-service approach.
- Foster trust and long-term relationships, rooted in reciprocity and care, genuine community building and friendships as part of these networks.
- Address structural barriers to participation, such as access, language, and historical exclusion.
- Promote shared leadership and decision-making, ensuring power is equitably distributed.

By **centring strengths rather than perceived deficits**, this approach opens up more inclusive and respectful channels of communication and spaces allowing for exploration and learning.



This also ensures that **cultural heritage is made visible** – not in isolation, but in relation to the lived realities and structural contexts that shape the lives of those too often rendered invisible in policy and practice. This reframing is essential for building environmental strategies that are not only effective but also just and representative.

‘...I think when I started at the beginning, I would not have thought that we’d be talking about self-care, meditation, self-care, meditation, music, and smells. Yes, but you see how it all links in...’ (Learning Community participant)

Message for Policy Makers: From the Margins to the Centre of Biodiversity Initiatives

This UK case study demonstrates what is possible when communities that have long been excluded from environmental narratives are invited not only to participate, but also to take the lead through a collective approach that respects, trusts and centres their lived nature experiences and knowledge. Through trust, care, and connection, Black, Asian, and ethnic minority participants reimagined their (ancestral/historical) relationships with nature and, in doing so, provided powerful lessons for creating a more inclusive and biodiverse future. In order to be genuinely inclusive in nature-based research like this case study, it is vital to meet communities where they are and build on those starting points. Understanding the realities of minority ethnic communities’ lives is essential for shaping biodiversity strategies, making them more adaptable, grounded, and effective than top-down approaches alone. Representation must go beyond tokenism – it requires deliberate action.

Key principles include:

- **Active listening** and the use of **inclusive approaches**
- **Valuing diverse ways of knowing and doing**
- **Creating leadership pathways** for underrepresented communities

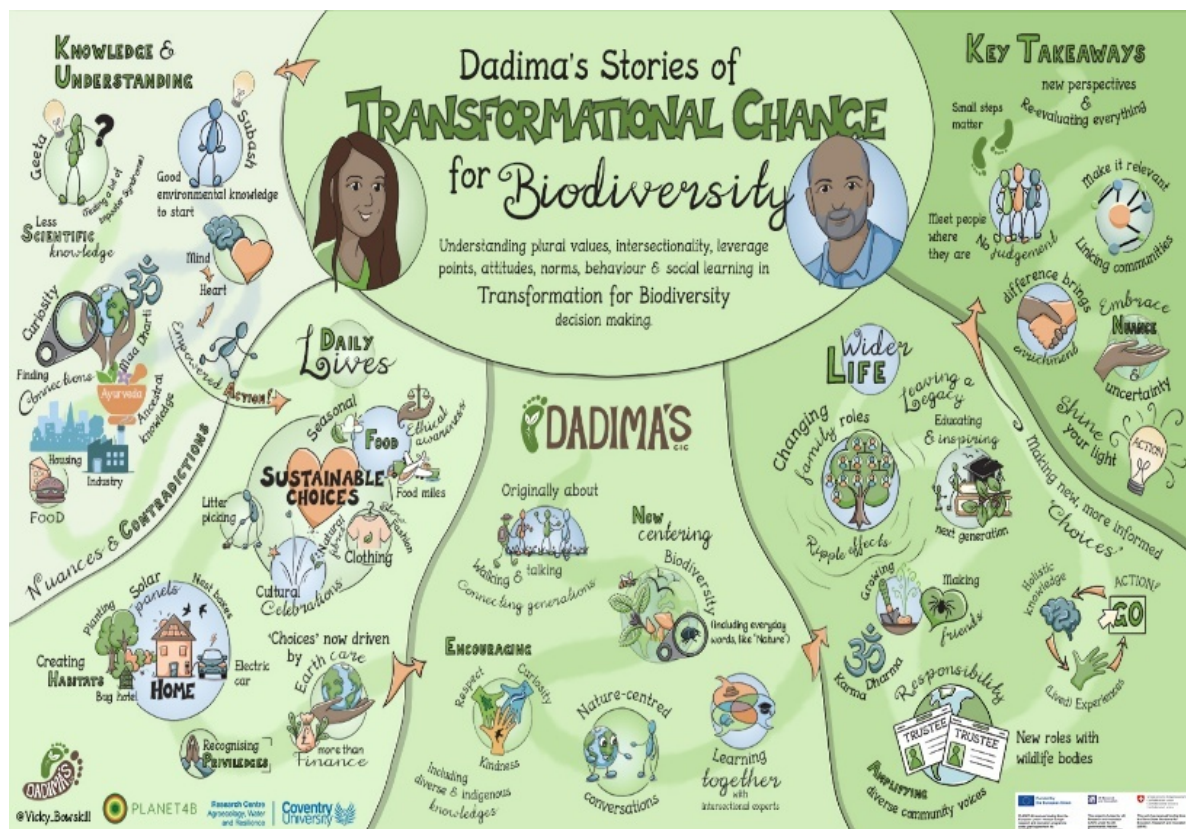
Active inclusion is not just about who is present – it is about **who shapes the agenda** and **whose voices guide the change**.

During one Learning Community workshop, a member of the learning community shared that his engagement in the project prompted a process of deep reflection, leading to the demystification of ideas he had previously associated with tackling issues such as biodiversity loss.

‘So, there was that tension. I need to commit time to this because it is so important, but there was the barrier of time and prioritising it. Why should we do it? It was me. The barrier was really thinking about why I need to prioritise this. Why does it need to move up on my personal agenda? And how can I do it? It made my barrier, and I didn’t know what I could do to improve biodiversity. I didn’t realise it would be this simple – so straightforward. I was overthinking it, thinking too big. I thought I couldn’t do it on a smaller scale’.

Sustainability Through Solidarity: Each One Teach One, communities engaging with nature and with biodiversity-related action

There is an increasing need for policymakers to actively support community-led initiatives. This illustrated infographic titled **"Dadima's Stories of Transformational Change for Biodiversity"** highlights the interconnected themes of biodiversity, daily life choices, social learning, and systemic transformation. This visual is not just a map of ideas – it acts as a storytelling and educational tool, grounding environmental community action in everyday life, cultural wisdom, and systemic understanding. It represents how sustainable engagement is not top-down; it is community-rooted and relationship-based, founded on trust, reciprocity, and mutual learning. At the core of the "Each One Teach One" idea is a notion of shared responsibility for learning – acknowledging that everyone has something to teach and that knowledge should be shared in an inclusive and empowering manner. This aligns with community-led, intergenerational, or informal education settings, such as the UK PLANET4B Learning Community and the approach used by community-led organisations, such as Dadima's.



To be deeply, truly effective, nature and biodiversity research **initiatives and actions** must:

- Be **grounded in the daily realities** of the communities they seek to serve so that they can make concrete connections and see a strong purpose in engaging in making (small) changes.
- Embrace **meaningful, inclusive forms of engagement** that go beyond tokenism and are respectful of the cultural and social capital to be found in communities. This is evidenced by the wide-ranging topics covered and actions shared by learning community participants
- Honour and uplift **alternative narratives, cultural traditions, and knowledge systems** that are all too often overlooked.

This spirit of 'Each One Teach One,' characterised by shared responsibility and empowerment, fosters resilience, connection, and collective action in addressing issues such as biodiversity loss. As highlighted by a Learning Community participant:

'Community-led organisations like Dadima's play a pivotal role in improving representation and fostering trust, and are important 'cultural brokers' and can act as a link between communities and statutory, private and other bodies engaged in environmental-related issues such as biodiversity'. (Dadima's CIC, Workshop 2)

References

- S. Díaz et al., The IPBES Conceptual Framework – connecting nature and people. *Curr. Opin. Environmental Sustainability*. 14,1–16 (2015). DOI: 10.1016/j.cosust.2014.11.002
- Martin, A. J. F., & Conway, T. M. (2025). Using the Gini Index to quantify urban green inequality: A systematic review and recommended reporting standards. *Landscape and Urban Planning*, 254, 105231. <https://doi.org/10.1016/j.landurbplan.2024.105231>

Bibliography

- Holliman, R., Ludhra, G., Warren, C.J., Khatwa, A., Araya, Y., Smith, K., Ansine, J. and M.S. Badger (2024). Co-constructing ‘third spaces’ for engagement with and for minoritized community groups and environmental scientists. *Earth Science, Systems and Society*, 4:10119, <https://doi.org/10.3389/esss.2024.10119>.
- Agyeman, J. (2005). Sustainable communities and the challenge of environmental justice. New York: NYU Press.
- Chatterton, T., & Fuller, D. (2015), Engaging diverse communities in nature conservation: Barriers and opportunities, *Conservation & Society*, 13(4), 382–394. <https://doi.org/10.4103/0972-4923.179388>
- Natural England. (2012). Greening the Gateway: Black and minority ethnic communities and green space. Natural England Commissioned Report <https://webarchive.nationalarchives.gov.uk/ukgwa/20140605090108/http://publications.naturalengland.org.uk/publication/45002>
- Sewell, A., & Baker, J. (2013). Inclusion of ethnic minorities in environmental and conservation work. Scottish Natural Heritage Commissioned Report No. 590. <https://www.nature.scot/doc/research-report-no-590-inclusion-ethnic-minorities-environmental-and-conservation-work>

Resources

- Groundwork UK – Inclusive Green Spaces Toolkit: <https://www.groundwork.org.uk> – Guides on engaging underrepresented communities, especially in urban settings.
- Black2Nature: <https://www.black2nature.org> – UK-based initiative promoting outdoor and biodiversity experiences for diverse youth.
- Race Equality Foundation – Environment Briefing Papers: <https://raceequalityfoundation.org.uk> – Research-based approaches to environmental justice and ethnic minority access.
- Royal Society for the Protection of Birds (RSPB) – Community Engagement Resources <https://www.rspb.org.uk> – RSPB has specific diversity outreach materials and reports.

Swiss farmers' religious and spiritual beliefs and biodiversity (Annex 7)

Story of Transformative Change: Swiss attitudes towards agriculture-biodiversity (Switzerland)

Author: Ghezal Sabir

Background

Agriculture is one of the major drivers behind land use change and biodiversity loss. Whereas systemic and institutional values largely steer agriculture-relevant decision-making, personal values are one of the key determinants of environmental behaviour. But where do these values come from? Many people use religion or a value-based system of beliefs to calibrate their moral compass, but very little is known about the relationship between faith and agro-biodiversity decisions in a European context.

There are examples of initiatives that have shown how religiously-framed messages can help promote ecologic farming practices in Africa (Kooy & Spaling, 2019). With the late Pope Francis' message of *Laudato Si*, calling on humanity to care for Earth (McKim, 2019) and the Orthodox Christianity's leader Bartholomew, also known as the Green Patriarch, many religious leaders have been promoting the principle of caring for environmental health. In Switzerland, an association of *Churches for the Environment* (*oeku – Kirchen für die Umwelt*, n.d.) has taken up the task of promoting environmentally-friendly practices in churches and church-based communities. Christianity is the predominant religion in Switzerland, with Catholicism and Protestantism being the dominant doctrines. The largest land use in Switzerland is dedicated to agricultural activities (Federal Statistical Office, 2024), covering 35% of the national territory. Therefore, farming activities can have a substantial effect on biodiversity. Considering that farmers live in rural areas that are generally more conservative than urban areas, studying the effect of religious and spiritual beliefs on biodiversity can help realise the potential of religious framing of biodiversity-promoting messages. The objective of one study undertaken in PLANET4B in Switzerland in 2023–2025, was to explore how Swiss farmers construct the relationship between religion and spirituality and their biodiversity-related behaviour.

What we did

We engaged with farmers to produce pictures that showed their religious/spiritual beliefs' connection to farming behaviour with a biodiversity backdrop. These photos are being used to trigger the audience (community, academic, and institutional actors) to think about how beliefs can positively influence what we do for biodiversity.

We focus on the use of a photo exhibition as a scientific method. Being able to reflect on this method as an intervention and a scientific method, accuracy in data collection and evaluation can help in assessing the accuracy of measuring or assessing the transformation for which we aim.

Exhibitions have been in the German language as well as the majority of communication for the local communities. For a wider reach, we have produced articles in English and work with PLANET4B communication to do short videos and articles for online dissemination. An academic article about theories connecting religion to

environmental behaviour has been published (Sabir et al., 2025), with another article based on the data from farmer interviews being prepared for publication.

Overarching goal of the case study: Make people think ethically when they engage in behaviours that have implications for biodiversity.

Target population: General population with relatively more focus on farmers.

System map and leverage points

The following figure demonstrates the factors that influence the desired change that the study targeted. This systems map was devised based on the data from interviews and data from two focus groups with individuals connected to farming, biodiversity, or religion. The topic of the study, the relationship between religious and spiritual beliefs and biodiversity, was located on a systems map, showing where the various variables play a role in influencing farming behaviour in Switzerland.



Figure 1. Systems map showing the factors that influence the desired change targeted by the study.

In this map, in Figure 1, the desired change was getting farmers to recognise and practice their values, focusing on their religious and spiritual beliefs, in connection to biodiversity. This was placed at the centre of the systems map. The first onion ring around this centre identified the immediate or proximate factors that influence this

desired change while the outer onion circle shows the distal factors that influence this desired change.

Based on the leverage points theory, connecting biodiversity to values, which in this case was religious and spiritual beliefs, lies at the human mind-set level. Change at this level is profound, requires a long time to achieve. Thus, the goal for this study was to set this change in motion or support the already-existing initiatives in the context of Switzerland and in the wider European context via PLANET4B and the global context via scientific publications as an example.

Communicating the story

Photo exhibitions are being held in different communities, a presentation at a church already took place about the story, a podcast and newsletter articles (3 in total) have already been published (two in online magazines and one in a community newspaper). One academic article has been published about the theories used in studying the connection between religion and environmental behaviours. Another article specific to the data from farmer interviews is being prepared for publication in a scientific journal.

Also, PLANET4B website is used to communicate the story to a larger audience while the deliverables communicate this to funders/partners/and online communities.

What has changed

Attention to the topic of connecting religious and spiritual beliefs to farming triggered reactions in different communities. Reactions from the general public were received via email by the principal researcher, with one message from an ex-farmer association's president emphasising the importance of the topic for farming. An invitation was received by the principal researcher to talk about the study at a church-based Thanksgiving event.

A connection to a newsletter editor was established for another article to appear in the fall of 2025. Currently, another article for a magazine targeting the protestant-faith community in the German part of Switzerland is being prepared, which was initiated by a freelance journalist.

The surveys from photo exhibitions revealed that a number of people who had never connected biodiversity to religious and spiritual beliefs before attending the exhibition saw the connection between the two concepts after seeing the exhibition. Participants also shared their views about the link between religious and spiritual beliefs and biodiversity by posting notes on a public display.

Materialising change from the mindset level to the actual behaviour takes time and is influenced by various contextual factors. Therefore, it is difficult to measure the effect immediately or even expect a major shift in behaviour in a short span of time.

Academically, the study is contributing to the literature on human values, including religious and spiritual beliefs and environmental behaviour. To date, the first article has received 66 reads in less than three months from countries beyond Europe.

Future vision: What should the transformative change look like?

The adoption and expression of a common concern for the environment as a religious duty by faith communities in general, with the recognition of the link between religious and spiritual beliefs and biodiversity. It is expected that this adoption would be expressed in various activities and practices of the people in various faith communities, which has a strong potential to extend beyond the religious and spiritual circles to influence all aspects of life in various communities.

Pathways: How can we achieve this vision?

To achieve this vision, opportunities need to be seized, and barriers overcome. These are outlined below:

Opportunities and ideas

The following ideas for increasing the reach of the desired change, which was originally for this project to get farmers to connect their religious and spiritual beliefs to their farming practices, came up during the workshops with the stakeholders. During the workshops, ideas about how to achieve the transformative change were brainstormed. The following ideas were presented:

- There was one idea about broadening the interventions mentioned above to not only farmers but also to other professions that are linked to the environment as well. Garden planners and architects' targeting or inclusion was one such example. The interventions can also bring these actors with different professions together.
- Public activities such as nature-based activities can incorporate messages that connect people's values and beliefs to nature and their activities. This is to build on the momentum already observed with ever more people who are interested in nature and are looking for this connection with nature. This is an opportunity to promote the desired change.
- The same momentum can be directed to strengthening the relationship between farmers and consumers. Some examples presented included harvest festivals and community-supported agriculture.
- The "Green Chicken" certificate program was deemed to have high standards, making it difficult for many interested churches to attain it. There was an idea to help churches that do not meet all the criteria for the certificate to enter a transition phase and be recognised for their achievements towards becoming an environmental church in future. This would help bring visibility to the connection between faith and environment in more churches than is currently possible and also support churches in their efforts towards environmentally friendly practices. Similarly, there was a suggestion about keeping the message of Pope Francis alive by organising an annual celebration of the *Laudato Si*, apostolic exhortation addressing humanity to care for our common home being Earth. This would help promote messages about biodiversity preservation and protection.
- The season of creation is an annual time period, "*from Sep 1 to Oct 4 since 20 years*" (a participant), when people of faith, mainly attended to by Christians, are called upon to take care of nature. This is a time when awareness about environmental issues can be promoted in connection with religious beliefs.
- The "green chicken" type of certificate program can also be developed for other faith-based businesses and communities. This can make the reach of the

program and its effect wider in different societies and promote religious diversity while bringing the goal of environmental protection and respect for nature and the creation as a commonality among them.

- Another idea connected to churches was to create open spaces for people from different backgrounds and those who would not be tied to a particular denomination to come together to engage in nature-based activities. An example of a children's garden project was provided during the discussion to illustrate how children were provided the opportunity to learn respect for nature and work to support it from a young age.
- Likewise, another suggestion was to increase and/or bring more visibility to spiritual groups who undertake forest walks and other activities in nature. This can help encourage others not connected to these circles to participate and learn to appreciate nature and value it. Agricultural areas can also provide such spiritual excursions.
- An example of eco-villages was provided to express how the idea of nature and biodiversity protection is not to be restricted to farming but that it can include different areas of life. So this would be a model program to strive towards when it comes to addressing other areas of life and not just agriculture.
- Lastly, there was a comment on nurturing alternative communication channels away from large channels to allow for the inclusion of more diverse opinions and ideas.

Barriers identified

The following barriers were identified during the two workshops with stakeholders:

- Regarding the "green chicken" certificate program, one of the barriers was the reliance of churches on volunteer work, which can be unreliable and inconsistent. Another barrier identified was the considerable amount of work for small churches, who, despite their dedication to environmental protection, may be unable to participate in the program and thus their efforts remain unrecognised.
- Although there were ideas connected to the church expressed in relation to the promotion of the change desired, a few participants also pointed to the diminishing effect of religious institutions or the church in the lives of people. "The role of the church has changed in today's world, with many people leaving and religion being removed from the education system. In Graubünden we have fought for religion to remain part of the curriculum. It is important that we support the young, well-educated women who know what they want and take the lead in agriculture." (a learning community participant). The participant's suggestion is that connecting environmental concern with religion may be a barrier to promoting care of nature as religion may not be a strong of a factor in many people's lives in today's society. Similarly, another participant expressed how "A sustainable Christian church or community should be ecumenical. Nevertheless, traditional structures persist, which vary from region to region.
- Similar sentiments about connecting biodiversity to religion were expressed in one focus group as a participant said "[...] I think there are also quite a lot of people who are perhaps not active atheists, but who actually have quite negative feelings about religion. And there is perhaps also a bit of a danger that people today will be put off if they associate the promotion of biodiversity too strongly with religiosity. [...] I could see biodiversity in the current or next

generation when too strongly linked to religious values, because then some people will no longer be able to join in because their beliefs are different.” So, finding a common ground would be needed.

- The economic pressure was pointed out as a barrier to farmers’ putting their spirituality into practice. “When I visit farms, I feel a sense of reverence and solidarity, but the economic pressure and the need to survive at unjustified prices are a major problem. We are part of a global economy where European and political decisions are difficult to influence. Prices for agricultural products have lagged behind other products, which is an existential problem.”
- The two factors here at play are the church being closed to dealing with the reality of the world outside, that is with differences in religious beliefs, and the farmer facing economic pressure to stay competitive in a financial-centred business model by way of its participation in the global economy.
- Thus, the challenge to bring spirituality into farming practices has become enormous as one participant expressed: “More communication is needed to raise awareness [about farming’s connection to religious/spiritual beliefs], but farming must remain profitable, and time is often a scarce commodity. This is particularly relevant in farming life. Under pressure to produce, there is little room for spirituality and exchange. This could be an important question for the future.”
- The conflict between values and economics was, hence, put forth as the biggest barrier to realising one’s religious and spiritual beliefs in the way one farms, as the latter is often driven by economic considerations.
- One participant proposed “to continue this discussion and consider whether we should link the topic to resources or whether we should talk about ethics instead of spirituality, as spirituality has some denominational connotations.”

References

- Federal Statistical Office. (2024). Agricultural areas. <https://www.bfs.admin.ch/content/bfs/en/home/statistics/territory-environment/land-use-cover/agricultural-areas.html>
- Kooy, K., & Spaling, H. (2019). Farming God’s Way: Agronomy and Faith Contested. *Agriculture and Human Values*, 36(3), 411–426. <https://doi.org/10.1007/s10460-019-09925-2>
- McKim, R. (2019). *Laudato si’ and the environment: Pope Francis’ green encyclical*. Routledge.
- Oeku – Kirchen für die Umwelt. (n.d.). Retrieved 4 June 2025, from <https://oeku.ch/>
- Sabir, G., Tennhardt, L. M., & Home, R. (2025). Heaven and earth: A systematic review of theories on the relationship between religion and environmental behaviour. *Discover Sustainability*, 6(1), 178. <https://doi.org/10.1007/s43621-025-01005-2>

Planting Seeds of Change: growing into a community-led experiment in cultivating both biodiversity and belonging (Annex 8)

Story of Transformative Change: City food for biodiversity and inclusion (Graz, Austria)

Authors: Sandra Karner, Miriam Krause, Andreas Motschiunig, Katharina Santer, Christina Seliger, David Steinwender, Anita Thaler

Unequal Roots in the Urban Green

Biodiversity loss is often viewed as a distant issue, yet it has a direct impact on food security, health, culture, and climate resilience. Its protection depends on everyday practices, especially in cities where green spaces provide vital benefits but remain unequally accessible. Governance frequently prioritises ecological outcomes over participation, excluding disadvantaged groups – by gender, migration status, class, or age – from shaping and benefiting from biodiversity initiatives.

In Graz, as in many cities, access to both green space and “good food” is unequally distributed, with privileged groups benefiting disproportionately. Alternative food initiatives often perpetuate exclusivity, while the municipality lacks an integrated policy framework for food and biodiversity. Strategies remain fragmented across departments and shaped by narrow agendas. Despite more than 30 community gardens, many low-income, migrant, or marginalised residents face physical barriers (distance, language) and symbolic ones (feeling unwelcome, lack of decision-making power). Without deliberate inclusion, such initiatives risk reinforcing inequality or contributing to “green gentrification.”

Spatial inequalities deepen these challenges. Neighbourhoods dominated by sealed surfaces often lack trees and accessible green infrastructure, leaving them vulnerable to climate impacts and depriving residents of opportunities for recreation, food production, and daily contact with nature. Addressing these issues requires an integrated municipal strategy that links biodiversity, food justice, and equitable access to green space. Only through deliberate inclusion and cross-sectoral cooperation can biodiversity initiatives avoid reinforcing inequalities and instead foster systemic urban transformation.

Biodiversity needs a people-centred turn

The EU-funded **PLANET4B project** addresses this by placing historically excluded people at the centre of transformation. Lasting change requires more than ecological targets or technical fixes: it depends on behavioural and institutional shifts that empower diverse communities to act as co-creators and stewards of biodiverse places. The **Bio-/Diverse Edible City** case study in Graz (**‘BEST Graz’**) asked:

How can a BEST Graz integrate biodiversity, food and social inclusion, so that those often excluded are not only beneficiaries but also active agents? How can biodiversity become meaningful and actionable for these agents?

Co-designing Bio-/Diverse Edible Urban Green Spaces through Learning Communities

To address these questions through a Living Lab, two **Learning Communities** were established. The **Policy Learning Community** brought together municipal staff, CSOs/NGOs, experts, social workers, and artists to explore how a “BEST Graz” strategy could connect biodiversity, food systems, and social justice, and whether an edible city approach might catalyse more integrated policymaking.

Guided by an intersectional perspective (Thaler & Karner, 2023), the project also identified women* with migration histories, single mothers*, and single-living retired women* as particularly vulnerable to poverty and exclusion, often tied to limited access to green space and food insecurity. The **Citizen Learning Community** engaged 15 women* from these groups alongside gardeners, experts, artists, and researchers in co-design and co-creation. This process gave rise to the GAIA Gartenberg community garden – both a brave space and a community hub – where participants drew on their lived experiences to create a biodiverse, productive garden that fosters inclusion, agency, and stewardship.

Community gardens in a Bio-/Diverse Edible City Graz

In Graz edible landscapes nourish both ecosystems and communities – a Bio-/Diverse Edible City in which biodiversity (“bio”) and human diversity (“diverse”) thrive together. Gardens are not just places to grow food, but shared learning commons – spaces for co-creation, sharing, community building, and empowerment. Here, biodiversity is not an abstract policy term, but something lived daily, smelled, tasted, mapped, and celebrated.

In these gardens, people from diverse genders, cultures, social backgrounds, ages, and languages come together to plant, harvest, and share food. They exchange seeds, recipes, and gardening traditions, tell stories, and take collective decisions on how their spaces evolve. Participation is genuinely low threshold, supported by multilingual facilitation, childcare, and flexible formats, while brave spaces invite dialogue and difference.

This vision envisions municipal departments collaborating closely with grassroots networks to integrate biodiversity into urban planning. By co-designing inclusive green infrastructure, they ensure that Graz’s edible city is also an equitable city, where food, biodiversity and social justice grow from the same soil.

How the transformation in the GAIA Gartenberg took root From Listening to Belonging to Stewardship

The project began not with tools and seeds but with listening. Facilitators invited stories of place, memory, and food, building trust through nature walks, shared meals, and storytelling. These encounters lowered barriers and turned a research site into a welcoming circle of trust. Rituals such as check-ins and communal gardening wove bonds, while the decision to build the garden fence together marked a turning point – labour became belonging, and ownership was embodied in the words *“This is our garden”*.

Learning unfolded through hands-on practice. Participants mapped ecological features, experimented with pollinator-friendly planting, and exchanged cultural

growing traditions. Over time, participation grew into stewardship: women* welcomed newcomers, coordinated tasks, and eventually founded an association to manage the garden beyond the project run. What began as research evolved into a self-organised community asset – an inclusive, living space where biodiversity, belonging, and collective agency could flourish side by side.

Cultivating methods of co-creation

Methods were designed to share ownership, surface hidden knowledge, and link ecology with everyday life. Participatory Action Research framed the garden as a Living Lab where participants co-defined priorities, tested ideas, and reflected in cycles of action and learning. Community mapping traced pollinator paths, safe spaces, and places of meaning, turning maps into tools for learning and collective memory.

Experience strolls and storytelling circles connected ecological concepts to recipes, memories, and seed traditions, legitimising lived experience and bridging languages and generations. Horticulture activities combined hands-on gardening with peer-to-peer knowledge exchange. A diversity workshop encouraged reflection on ecological and social diversity by linking personal experiences with informal skills, political participation, and appreciation of green spaces. Finally, discussions of socio-scientific issues connected everyday objects to global systems of supply, labour, and climate impacts, making visible the broader structures shaping daily choices.

Growing transformation in the GAIA Gartenberg

The GAIA Gartenberg became more than a garden; it evolved into a living community where trust, learning, and empowerment flourished. What began with soil, tools, and tentative meetings grew into a circle of belonging and collective agency.

Women* who initially held back due to language barriers or lack of confidence soon felt welcomed, taking on roles such as coordinating tasks, welcoming visitors, and representing the group. Biodiversity was no longer abstract but tangible – visible in garden beds, tasted in fresh harvests, and linked to health, family routines, and cultural food traditions.

Shared labour, such as planting and harvesting, fostered solidarity, with leadership circulating and emerging organically through mentoring. By grounding biodiversity in food sovereignty, cultural exchange, and everyday practice, the project reframed it from a distant ideal to a vital element of wellbeing and resilience.

What made the transformation possible

The success of GAIA Gartenberg grew from a constellation of resources and practices that together created the conditions for change. The Living Lab was built upon earlier projects undertaken by team members and local partners, which provided contextual insights and reliable relationships with key actors.

A supportive institutional climate gave legitimacy and space for experimentation through political endorsement, cooperation with the green space department, and PLANET4B funding, reinforced by neighbourhood support that signalled welcome rather than resistance. Equally vital were facilitation practices: brave spaces built on trust, multilingualism, and cultural sensitivity fostered openness and co-agency. Low-threshold access (e.g. translation, flexible participation) helped remove barriers, while

relational processes, such as shared meals and collective decision-making, turned gardening into a sense of belonging.

Physical resources, such as land, water, tools, and seeds, provided a stable base, while PLANET4B funding enabled exceptionally comprehensive planning and facilitated implementation. Partnerships with municipal departments, social services, and CSOs anchored the project in the broader web of support, amplifying knowledge and assets. Finally, embodied learning through gardening, cultural exchange, and sensory practice made biodiversity tangible and meaningful.

Barriers and Tensions

The project also revealed challenges, and addressing these barriers requires long-term institutional commitment, not just short-term projects:

- **Structural fragility:** Without ongoing funding, facilitation capacity, and municipal backing, sustaining such spaces is difficult.
- **Transferability limits:** Success relied on a unique convergence of local actors, political openness, and funding windows.
- **Hidden inequalities:** Many women* did not initially see themselves as disadvantaged, masking systemic barriers that only surfaced later.

Lessons Learned – What It Takes to Grow Change

The GAIA Gartenberg shows that inclusive, co-created green spaces can grow biodiversity and social justice together, when rooted in lived experience, shared stewardship, strong community support, and policy commitment:

- **Start with people's realities, not just policy targets:** Trust proved to be the fertile soil from which transformation could grow. Listening deeply to participants' lived experiences and respecting their priorities ensured that the project was rooted in genuine needs.
- **Lower participation barriers:** Childcare, translation, and flexible scheduling were not add-ons, they were prerequisites for inclusion. These supports enabled women* from diverse backgrounds to engage fully and confidently.
- **Value all forms of knowledge:** Lived experience, cultural traditions, and practical skills enriched work in the garden and on biodiversity as much as scientific expertise. Recognising and integrating these different knowledges created a richer, more relevant learning environment.
- **Celebrate diversity as a strength:** Cultural and linguistic variety brought fresh perspectives and new practices to the garden, enhancing both social cohesion and ecological resilience.
- **Sustain facilitation until self-organisation blooms:** Skilled facilitation in the early stages was essential to overcoming barriers, building momentum, and preparing the ground for a self-sustaining community. Only once trust, capacity, and relationships had matured, the women* could take full ownership, forming an association, writing statutes, and managing the garden independently beyond the project duration.

Seeds of transformation that can take root and flourish in other cities

For municipal actors, CSOs/NGOs, and community groups inspired by Graz's example, the following moves can plant the seeds of transformation towards Bio-/Diverse Edible Cities:

- **Secure accessible space:** Partner with municipal land managers to provide low-cost, centrally located plots with access to water, tools, and other resources.
- **Invest in facilitation:** Allocate budget for skilled, culturally and socially competent facilitators who can sustain trust and participation.
- **Embed inclusion from the start:** Co-design participation frameworks with local connectors and remove potential barriers, e.g. through flexible engagement settings.
- **Establish joint governance structures** between municipal departments, garden associations, and community-driven initiatives.
- Develop a city-wide **food and biodiversity strategy** linking ecological goals with social inclusion.
- **Institutionalise support** for community-driven green infrastructure through policy mandates and dedicated funding lines.

Conclusions

The story of the Bio-/Diverse Edible City Graz and the GAIA Gartenberg shows how gardens can grow into far more than physical spaces. They become laboratories for rethinking how biodiversity, social inclusion, and governance intersect.

Over time, the garden plot evolved into what might be called a 'policy plot', a testing ground where everyday practices informed governance, and institutional frameworks were challenged, enriched, and reimagined through lived experience. Partnerships with NGOs, municipal departments and social services bridged grassroots insights with decision-making, ensuring that participants' voices could shape Graz's future greening strategies. Today, the GAIA Gartenberg stands as a living argument for why cities should fund facilitation, why departments should share governance, and recognise food, biodiversity, and social justice as inseparable threads of the same fabric.

Looking ahead: the GAIA Gartenberg's future

The GAIA Gartenberg has become more than a garden – it is a **nucleus for an emerging community park**. In the meantime, a second community garden has taken root, an orchard meadow has been planted, and new plans are already underway for a climate-resilient orchard and open-air learning spaces. The municipal green space department is a committed partner, signalling support for the Bio-/Diverse Edible City is becoming part of Graz's urban development.

The project's deeper legacy is in the lives of the women* who now see themselves not just as gardeners, but as urban actors – residents who can influence how their city grows. As one participant put it during the fence-building day:

"Before, I thought this kind of thing was for other people. Now I know it can be ours."

Evidence: How we learned what worked

We paired hands-on practice with systematic learning so that insights were not anecdotal but grounded in multiple sources. Each gathering closed with a structured reflection on shifts, inclusivity, and emerging hurdles, with immediate notes capturing the group dynamics. System mapping with the Policy LC identified leverage points, indicators, and barriers to systemic change connected to community gardening with broader opportunities for policy shifts towards a Bio-/Diverse Edible City Graz.

The project team, garden community, and Policy LC actors jointly reconstructed the journey, mapping key moments, turning points, and enabling factors, while reflecting with Policy LC peers on how municipal procedures could better support low-threshold participation and long-term stewardship. In-depth interviews with women* gardeners traced individual trajectories, exploring shifts in perception (“nature is here”), agency (from attending to initiating), and belonging (from participant to co-owner).

Together, these streams (real-time reflection, personal narratives, and collective analysis) produced a robust picture of what worked, why it mattered, and how it might be scaled.

The basic principles we built on our case study

Four interwoven principles guided the GAIA Gartenberg Living Lab. First, transformative learning (Mezirow, 1990) shaped activities that combined head, heart, and hands, turning abstract notions of biodiversity into lived experience. Second, knowledge co-creation acknowledged, with Haraway (2016), that knowledge is situated: scientific expertise was placed alongside participants’ cultural practices, gardening skills, and everyday observations, ensuring the garden reflected community realities. Third, an intersectional perspective (Crenshaw, 1989) anticipated and addressed overlapping inequalities of gender, migration, class, and language. Finally, the edible city approach (Säumel et al., 2019) linked biodiversity to food, culture, and care, making the garden simultaneously an ecological habitat, a site of culinary tradition, and a hub of social relations.

Together, these principles grounded the project in inclusivity and everyday life while providing orientation for ecological and social transformation.

Further case study-related materials

Video

[‘The Graz Community Garden GAIA Gartenberg – A Place for Women and Bio-Diversity’](#)

Booklet

[‘Bio-/Diverse Edible City Graz’](#). Ideas for Inclusive Policy Measures to Promote (Agro-)Biodiversity and Reduce Social Inequality. Findings of the Graz-based Case Study of the Horizon Europe Research Project PLANET4B.

Krause, Mirjam , Thaler, Anita , Santer, Katharina , Karner, Sandra , Seliger, Christina & Steinwender, David (2024). [Sowing change: A women*s garden as queer-feminist intervention in biodiversity research](#). Queer-Feminist Science & Technology Studies Forum, Vol. 9, December 2024.

- Steinwender, David, Karner, Sandra & Thaler, Anita (2025 forthcoming). Gaia women* garden: Co-Creating a space for transformative learning on bio-/diversity. In: Getzinger, G., Jahrbacher, M., Prună, R. (eds) Critical Issues in Science, Technology and Society Studies – Conference Proceedings of the 23rd STS Conference, Graz 2025.
- Steinwender, David, Thaler, Anita & Karner, Sandra (2025 forthcoming). Community-Lernerfahrungen aus dem GAIA Frauen*garten. Magazin erwachsenenbildung.at, Vol. 56.
- Thaler, Anita & Karner, Sandra (2024). [Can participatory action research deepen the understanding of intersectionality in the field of biodiversity research?](#) In: Carmen-Pilar Marti Ballester (ed.). Proceedings of the 7th International Conference on Gender Research, Barcelona. 378–387.

References

- Crenshaw, Kimberly (1989). Demarginalizing the Intersection of Race and Sex: A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics. *University of Chicago Legal Forum*, 1989(1), 139–167.
- Haraway, Donna J. (2016). Staying with the trouble. Making kin in the chthulucene. Duke University Press.
- Mezirow, Jack (1990). How critical reflection triggers transformative learning. In J. Mezirow & Associates (Eds.), *Fostering critical reflection in adulthood* (pp. 1–20). Jossey-Bass.
- Thaler, Anita. & Karner, Sandra (eds.) (2023). Methodological framework for intersectionality analysis. Report No D1.3 of the Horizon Europe Project 101082212 – PLANET4B. Brussels: European Research Executive Agency. DOI: 10.5281/zenodo.14871142. Available at: <https://planet4b.eu/project-documents/methodological-framework-for-intersectionality-analysis/>
- Säumel, Ina, Reddy, Suhana E., & Wachtel, Thomas (2019). Edible City Solutions – One Step Further to Foster Social Resilience through Enhanced Socio-Cultural Ecosystem Services in Cities. *Sustainability*, 11(4), 972. <https://doi.org/10.3390/su11040972>

Uncovering Psychological Barriers to Biodiversity-Positive Finance (Annex 9)

Story of Transformative Change: Sustainable investment behaviour (Global – EU – Norway)

Authors: Rafal Chudy and David N. Barton

Problem Statement: Investors' cognitive biases limit so-called ESG investment in companies that aim to protect biodiversity.

“ESG investment” refers to investors who include companies with environmentally friendly, good Governance, and socially beneficial business practices in their investment portfolios. At the core of our case lies a fundamental challenge: although the importance of biodiversity is increasingly acknowledged across sectors, actual investments remain marginal in companies that have protection or restoration of nature as part of their business model. Our aim within PLANET4B was to better understand this disconnect – not only by identifying systemic barriers, but also by exploring the subtler psychological and cognitive dynamics influencing investor behaviour.

We focused on the role of cognitive biases as often-overlooked barriers on the investor side to biodiversity-positive finance. Our literature review, interviews and discussions with stakeholder board members revealed that these biases often operate silently, complicating efforts to integrate biodiversity into mainstream ESG investing. We identified a significant gap in the sustainable finance literature, as our systematic review revealed the absence of studies that explicitly address cognitive biases in biodiversity-positive finance.

Vision: A financial system that sees biodiversity clearly – despite the noise

In the ideal future we collectively envisioned during our systems and stakeholder board (SB) workshops, biodiversity is no longer peripheral to financial thinking. Investors are trained to recognise their own behavioural blind spots and have access to simple, trustworthy financial tools that help mitigate the ‘biodiversity bias’ and uncertainty.

We imagined a shift at three levels:

- **Personal level:** Investors become aware of their biases against investing in companies that steward nature where they operate and actively seek to challenge their sole role as ‘placeless’ investors, becoming ‘place-conscious’ stewards through their investment choices.
- **Interpersonal level:** investment teams normalise open dialogue about biodiversity stewardship and nature risk.
- **Institutional level:** Investment decision-support tools provide access to the best available locally sourced data on nature values at sites of operation. Reducing uncertainty about local community & biodiversity impacts minimises the likelihood of using short-term cues, such as ‘gut feeling’ and ‘rules-of-thumb’ (heuristics), to compensate for uncertainty. Investment decision-support tools include pre-defined algorithms and scenario analyses that reduce reliance on personal heuristics.

From the above the vision of transformative change is more than technical – it is cultural and cognitive. As Meadows (1999) and Abson et al. (2017) emphasised, real change often comes from deeper leverage points, such as mindsets and values, not just better data. Overcoming behavioural inertia is as crucial as overcoming policy or market barriers.

What changed – and what didn't: A modest but meaningful impact

We acknowledge that our work with this extensive case study did not lead to any immediate visible transformation or change. Our work consisted mainly of a systematic literature review and discussing findings with the case study Advisory Board members. Within the short-term timeframe of the PLANET4B project actions, our review is situated at the shallowest leverage point in Meadows' framework, serving as a knowledge base that could potentially lead to R&D on “parameters” (leverage point #12) to reduce bias against biodiversity in investment decision-support models. Our case work is very much located in the “practical” sphere of the 3 spheres in the transdisciplinary framework for decision-support for biodiversity (Figure 1, D1.7).

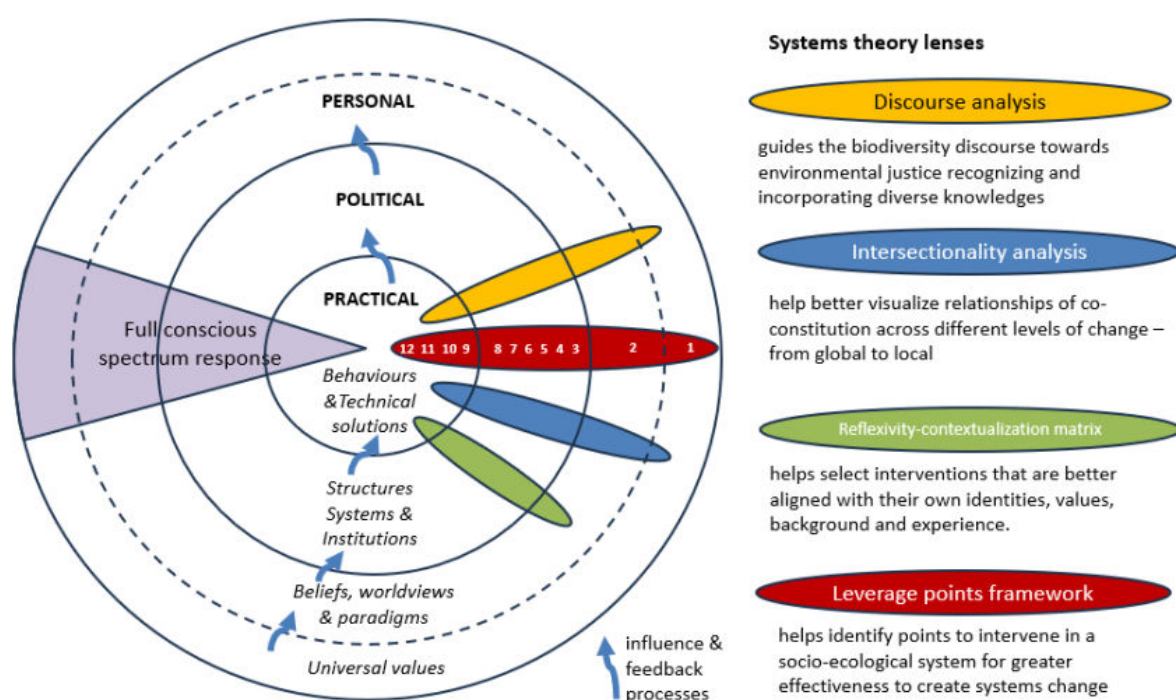


Figure 1. Draft transdisciplinary framework for diagnostic of decision support for biodiversity, after Sharma (2017).

We recently submitted a book chapter for peer review for Handbook of ESG Investing entitled “*Cognitive Biases in ESG Investing: Uncovering Psychological Barriers to Biodiversity-Positive Finance*” (Edward Elgar series). Depending on how this material is received and the Handbook is used, it may in the future support transformation through serving as, e.g. a curriculum in business and financial studies. If well-received, the chapter could serve as a foundation for future teaching tools that influence how the next generation of financial professionals engage with biodiversity, and may raise awareness about cognitive biases related to it. While we did not initially design our case for pedagogical use, this direction arose during discussions of the case study with PLANET4B peers. It represents a potential outcome of our research, but will require

further development of related teaching material after PLANET4B to have the envisioned impact.

Evidence base and further reflections

This story draws on:

- Our systematic literature review on cognitive biases and ESG investing.
- Meetings with our stakeholder board (SB), including leverage points analysis and systems thinking discussions.
- Our peer-reviewed chapter for the Handbook submission, which reflects on cognitive biases in ESG Investing, especially focused on biodiversity issues.
- Discussions with PLANET4B case study peers.

References

- Meadows, D. H. (1999). *Leverage points: Places to intervene in a system*. Hartland, VT: Sustainability Institute.
- Abson, D. J., Fischer, J., Leventon, J., Newig, J., Schomerus, T., Vilsmaier, U., von Wehrden, H., Abernethy, P., Ives, C. D., Jager, N. W., & Lang, D. J. (2017). Leverage points for sustainability transformation. *Ambio*, 46(1), 30–39. <https://doi.org/10.1007/s13280-016-0800-y>

Reimagining Trade for Biodiversity and Justice (Annex 10)

Story of Transformative Change: Trade and global value chains (Brazil – EU)

Authors: Vinicius Mendes, Cristina Y. A. Inoue

Problem Statement

With this case study, we wanted to develop outcomes that would help us achieve a trade system that respects and promotes a more nuanced understanding of human rights (intersectionality dimensions of environmental injustice, context-specific analysis of soy and beef supply chains). In addition, we wanted to provide evidence on how to increase social-environmental equity in supplier and demand countries of soy and beef commodities, in particular Brazil and the Netherlands. Finally, we aimed to provide policy recommendations that support the sustainable management and use of biodiversity through the trade sector.

The core problems we sought to address were related to the following:

- Dutch farming system is dependent on soy imports for animal feed, and the Land footprint of these soy imports is: 2.7 million ha each year (2017–2021), 2/3 the size of the Netherlands. This land footprint falls predominantly in Brazil (42%), the USA (28%) and Argentina (6%).
- Excessive nitrogen deposition in the Netherlands is associated with the imports of soybeans. Around 87 % of Nitr./ammonia comes from the farming sector, especially from cattle raising. Nitrogen is harmful to nature and humans.
- Roughly 20% of soy exports and at least 17% of beef exports from Brazil's Cerrado and Amazon biomes to the EU may be contaminated with illegal deforestation (Rajão, 2020).
- In addition, the trade of pesticides from the EU to Brazil for use in soy farms has growing impacts on human and ecosystem health, particularly in Brazil.

Our interventions were aligned with the following European policies, particularly:

- EUDR – European Union Regulation on Deforestation-free Supply Chains
- CSDDD – Corporate Sustainability Due Diligence Directive
- CAP – EU Common Agricultural Policy

Vision:

Transformations in the Trade Sector/System, for better periodising biodiversity and people, through:

- A trade system that respects and promotes a more nuanced understanding of human rights (intersectionality dimensions of environmental injustice, context-specific analysis of soy and beef supply chains).
- More attention to social-environmental equity in supplier and demand countries for soy and beef commodities, considering the EUDR.
- A trade system that supports sustainable management and use of biodiversity.

How to achieve this vision:

1. Raise awareness in Brazil and the Netherlands about the problems for biodiversity and people associated with the bilateral trade (supply chains) of soy and beef between the two countries.
2. Support Local Stakeholders in Brazil and Europe to understand better the impacts of soy and beef trade on biodiversity and people in both countries, while also pointing out potential resistance strategies, to change this scenario, and better prioritise biodiversity and people, especially in biodiversity-rich ecosystems such as the Brazilian Amazon, currently seriously threatened by the expansion of soy monocrops.
3. Provide policy recommendations to make EUDR more in line with Intersectional Environmental Justice.

What have we learned?

Leverage points for change in the trade sector resulted in recommendations from our research, also in line with Mendes et al. (2025) as well as with practices for transformative change, such as transdisciplinary practices used in PLANET4B (see Mendes et al., 2024). In this context, in our story of change, we propose 9 changes to urgently needed to transform the trade sector:

CHANGE 1 – Companies publicly sharing traceability data on commodity origination/polygon for soy & beef.

CHANGE 2 – Valuing forest peoples' socio-biodiversity value chains in sourcing countries of beef and soy commodities, promoting alternatives to the monocultural system, for example:

- Bioeconomy value chains.
- Agroecology systems.
- E.g. handicrafts, forest products, and ecological tourism, in Cerrado and the Amazon, could be alternatives to soy and beef expansion and related trade pressures.

CHANGE 3 – Valuing the preservation of native vegetation and biodiversity (land use) of sourcing countries in commodity trade relations/agreements, in line with human rights.

- Reducing, or ending, the volumes of beef and soy imported by the EU coming from the Amazon.
- Guarantee effective participation and secure the territorial rights and human rights of IPLC in biodiversity protection/in biodiversity protection/restoration activities in EU-linked supply chains.
- Assess intersectional environmental justice issues in biodiversity protection/restoration activities in EU-linked supply chains.

CHANGE 4 – Reform of the EU Common Agricultural Policy (CAP).

- Reduce subsidy for large-scale agri-business and industrial agriculture.
- Support considerably more agroecology and small-scale farming.
- More support to transition from intensive and export-oriented farming towards agroecological farming.

CHANGE 5 – Tackling pollution caused by soy pesticides in the Brazilian Amazon and Cerrado reducing the exports of pesticides from EU to Brazil and other sourcing countries.

- Stopping the production and exports of pesticides that are forbidden in non-EU countries.

CHANGE 6 – Understanding historical perspectives on soy-based agriculture & bring these stories into public debates and cultural imagination (raise public awareness about the impacts of the trade of soy/beef on biodiversity).

CHANGE 7 – Shape soy & beef stories according to **different audiences, e.g.** policymakers, businesses, youth, civil society/general population, different stakeholders impacted by the soy/beef trade system.

- Documentaries
- Creative storytelling
- Media

CHANGE 8 – Banning financing deforestation or forest degradation, by means of applying the necessary financial measures to banks, chemical companies, trading companies, large agribusiness firms, or others linked to intensive farming production & trade.

CHANGE 9 – Reducing the share of animal protein in the food system.

What can we do with this?

Promote such changes via disseminating them in adequate policy spaces. We have been doing this already, for example, [via audio-visual productions](#) (see Mendes et al., 2025), and co-production of policy briefs, with partners such as UNEP-WCMC (policy brief in production). Additionally, we have recently contributed to a report on pesticides, being edited by IUCN-NL (in production).

Additionally, we continue working on academic articles, resulting from this research. One of our articles was recently accepted at the International Journal of the Commons, to publicise our results to a specialised scientific audience.

Conclusion

With these materials, documentary, blog posts, policy briefs, and overall research findings, we hope to kick-start transformative changes in the global commodity trade sector, while, in parallel, supporting the protection of biodiversity-rich ecosystems, such as the Brazilian Amazon, as well as its forest peoples, local communities and Indigenous peoples. In addition, we hope that such changes will also positively contribute to restoring biodiversity in Europe through increased agroecological practices and a reduction in the extensive cattle-raising industry in EU countries, such as the Netherlands.

References

- Mendes, V., Inoue, C. Y. A., Søndergaard, N., & Tavares, N. (2025). Intersectional Environmental Justice in Dutch-Brazilian Beef and Soy Trade: Challenges for the EU Regulation on Deforestation-Free Products. *International Journal of the Commons*, 19(1), 293–306.
- Mendes, V., Inoue, C. Y. A., Barton, D., Binder, L., Bonetti, M., Booth, C., Bredin, Y., Brown, G., Bykova, M., Czett, K., Figari, H., Karner, S., Lipka, B., Ludhra, G., Ludhra, S., Navarro Gambín, P., Ofori-Amanfo, P., Pataki, G., Sabir, G., Simsek, E. T., Soliev, I., Steinwender, D., Thaler, A., & Zolyomi, A. (2024). Workshop report on theories relevant for biodiversity decision-making and their implications for practice. Report No D1.6 of the Horizon Europe Project 101082212 – PLANET4B. Brussels: European Research Executive Agency. DOI: 10.5281/zenodo.15274503
Available at: <https://planet4b.eu/project-documents/workshop-report-on-theories-and-its-implication-for-practice/>
- Rajão, R., Soares-Filho, B., Nunes, F., Börner, J., Machado, L., Assis, D., Oliveira, A., Pinto, L., Ribeiro, V., Rausch, L., Gibbs, H. & Figueira, D. (2020). The rotten apples of Brazil's agribusiness. *Science*, 369(6501), 246–248. <https://doi.org/10.1126/science.aba6646>

The Way of the Seeds: The Case of Open-Pollinated Vegetable Seeds (Annex 11)

Story of Transformative Change: Agrobiodiversity management (Hungary)

Authors: Borbála Lipka, György Pataki

Evidence Base

Within the project PLANET4B, we conducted semi-structured interviews with several stakeholders who play a pivotal role in the conservation of agrobiodiversity: gardeners, farmers, researchers, market and state stakeholders, and artists. Some of them manage, spread and give life to certain varieties; others work in legislation or raise awareness within the general public. During the interviews – among other things – we were looking for the idea about what a seed system would look like that's 'ideal' from the perspective of agrobiodiversity. What is needed in order to maintain or even develop the cultivated diversity? Who guards, knows and uses diversity in a system where the conservation of diversity is just as important as the production of vegetables?

Problem Statement

In the current production-oriented agricultural system, seeds are only treated as resources to maximise crop production. The methods of industrial agriculture are usually based on high inputs, a high level of mechanisation and the maximisation of quantity, while other parameters, such as the flavour, the composition or the cultural importance of the crop, are usually held back. Distributing the seeds of diverse vegetable varieties is strictly regulated or even illegal in many countries, whether for money or for free. Even in Hungary – where the legal environment is relatively supportive – the opportunities are limited. When creating regulations, decision makers often overlook the fact that varieties bred for industrial production are not necessarily suited for small-scale, low-input agricultural systems. Limiting the distribution of diverse varieties also ignores the fact that dynamic conservation or 'conservation in use' is an essential part of the conservation of genetic diversity. Losing diverse varieties is not only a loss of important cultural and gastronomic heritage but also the base materials of future breeding projects.

There is an exciting picture outlined in the interviews where the current paradigm – based on economic growth and production – is replaced by another one that is based on care and connectedness. In the vision drafted by our interviewees, exchanging knowledge and experiences, participation, the power of self-organisation in communities, as well as the admiration of life are important components. In the following paragraph, we will introduce this positive vision of agrobiodiversity, this potential future of the seed system, including its stakeholders and processes.

Vision

Seeds of open-pollinated vegetables are going around from hand to hand all around the country in the communities of amateur gardeners, small-scale farmers and the owners of community supported agriculture (CSA) systems. Seed swaps organised in many places are spaces for exchanging seeds as well as knowledge connected to them. Seed swaps are closely connected to initiatives that run civil and community seed banks all around the country. The structures of these initiatives are diverse: there

are seedbanks in local libraries, farms of local farmers, community centres, and local ethnographic museums to give home to seeds of landraces and other locally important varieties.

The vivid culture of communities proliferates around the seeds. Enthusiastic amateurs with diverse backgrounds, professional gardeners, as well as farmers, connect to each other and enjoy the lively community and social life coming from the seeds, the knowledge connected to the seeds. This knowledge, intertwined with growing practices, is constantly growing: new varieties and new seeds bring new opportunities for experimentation, new experiences of flavours and other senses. Plants offer an infinite source for the creativity in gastroculture, for all generations and groups with different social backgrounds.

The diversity of lands and communities reflected in the diversity of seeds, cultivation technologies as well as the structures of community seed networks, but, at the same time, forms one system whose dynamics offer endless opportunities for learning and development. Initiatives connected to each other on an equal basis are guarding the seeds as cultural and natural heritage and, at the same time, are accessible hubs of knowledge and learning. Those who want to connect – either to nature or society – have free access.

The civil gene bank network working on in-situ conservation is synergistically intertwined with the national gene bank maintained by the state. Expertise, knowledge and good practices are flowing in both directions, based on the needs of stakeholders. The professional (high-tech) infrastructure and expertise on ex-situ conservation in the national gene bank, the cooperating institutions of research and breeding, are advancing the quality of community conservation. In this process, the institutions of ex-situ conservation are also getting richer by the experiments, ideas and experiences of community seed networks. These networks of social innovation are also connecting small- and medium-scale ('family') breeding, seed growing and seed marketing companies. The expertise and infrastructure of these market actors are important levers in upscaling the system: they are the ones that bring the knowledge accumulated within the community seed networks to the market. They make good quality seeds of diverse vegetables available in such quantities that are needed for amateur gardeners, family farms and small-scale farmers (e.g. community supported agriculture systems), and contribute to the food security of the country in the end. The contribution of these small-scale market actors is essential for the circulation of seeds, and they get a fair salary, being able to provide the well-being of their families.

This network builds on a decentralised, self-organising dynamics; this provides its resilience. Everybody can get in contact with everybody else within their regions, and everyone can find the structure most suitable for them. Even if a part of the system gets damaged, the rest of the elements stay intact and are able to help the damaged element to heal: seeds and knowledge can flow back if there is a deficiency. The self-healing ability of a self-organising system is strong. Most importantly, none of the stakeholders can dominate or control the whole system: everyone will be equal, important, but not indispensable.

In order to achieve this stage, where nobody has enough power to hijack the control over the system, the wider institutional environment is crucial. Laws and regulations

safeguard the rights of farmers, gardeners, and communities to seeds and knowledge, ensuring that no entity with a monopolistic interest – whether from the state, the market, or science – is able to limit them. The same practice of reciprocity and free access prevails in the economic logic of food production that was mentioned in relation to the diverse and self-organising system of community seed banks. Profit will be born within cooperation, not contest, and the dominant economic and social attitudes embody this idea in this system. Just like attentive gardeners already learnt this deep cooperative attitude from seeds and plants.

How to Achieve the Vision?

The realisation of the vision outlined might seem quite distant at first sight, however, actually there is nothing missing that is needed for this care- and connection-based paradigm to spread: the 'seeds' of this system are all around us. Initiatives that allow farmers, gardeners, researchers, everyday people, artists, and decision-makers to make connections, along with seeds, already exist. More and more seed swaps are organised throughout the country year by year, often at libraries, community centres or other local institutions. There are more and more courses about ecological gardening and self-sufficiency all around the country. These initiatives and their organisers are connecting to each other at varied intensities, building an increasingly extensive and resilient network. In order to maintain and develop this network, it is essential to have a supportive legislative, regulatory and policy environment that allows the local seed and conservation initiatives to grow and connect and does not aim to overregulate and bureaucratise them. There are several aspects of this supportive environment, but one of the most important ones is the current re-negotiation of seed legislation in the European Union ("the new seed law"). In order to support the vision outlined above, it is essential to ensure that small-scale initiatives (individuals and communities as well as companies) are not regulated the same way as multinational and other exclusively market-oriented agribusiness companies are.

Further Reading:

Borbála Lipka and György Pataki: Recommendations for agrobiodiversity conservation in the ongoing reform of the European Union's seed regulation. PLANET4B Policy Brief, February 2025.

[Cookbook: Unknown Delicacies – Amazing Vegetables and Recipes from the Kitchen Garden](#)

A transformative change story in biodiversity education (Annex 12)

Story of Transformative Change: Environmental awareness raising in education (Hungary)

Authors: Eszter Kelemen, Kármén Czett

Problem Statement

In today's turbulent times, people are increasingly losing touch with nature, leading to significant consequences on multiple levels. On a **personal level**, this disconnection contributes to declining physical and mental health, a lack of ecological knowledge, and diminished personal responsibility for the environment. On a **practical level**, the lack of direct experience with nature results in reduced care and stewardship, as people fail to see their role in protecting biodiversity, as well as the values in their diverse natural surroundings. On a **political level**, nature is often treated merely as a resource rather than a vital partner in sustaining life, leading to policies that prioritise short-term economic gains over long-term ecological balance.

Children are particularly vulnerable to this growing disconnect. They lack decision-making power, yet their entire future is at risk due to interwoven environmental, economic, and health crises (polycrisis). While **environmental education** has the potential to bridge this gap, it is typically confined to classrooms and taught in silos, limiting its impact and preventing the development of a holistic worldview.

Experiential learning, particularly through school gardens, offers a powerful solution – allowing children to engage directly with nature, develop ecological stewardship, and build resilience. However, in Hungary, despite the presence of hands-on environmental education practices, systemic barriers such as centralised curricula, overburdened teachers, and a lack of institutional support hinder their widespread adoption. *How can school gardens and hands-on biodiversity education be integrated into public education to reconnect children with nature and drive transformative change?*

Our Vision

Children grow up with a deep, experiential connection to nature, fostering environmental stewardship, resilience, and well-being. Subjects are taught with a holistic approach, emphasising the interconnectedness of all living creatures. School gardens and nature-based learning become an integral part of education, empowering students, teachers, and communities to engage with and promote biodiversity. With the help of educational and teachers' associations, policymakers recognise and support experiential learning as a core element of the curriculum, ensuring that every child has access to green spaces for learning.

How can we achieve this vision? Evidence from our case study

Through strengthening the personal and practical spheres of transformation

Case study: A school garden created through participatory action research, leading to personal and organisational changes at the school level

Co-Creating a School Garden: A Transformative Journey:

1) **Seeding the idea**

A local secondary school teams up with researchers to transform an abandoned green area next to the school into a school garden. Funding is secured through a European research call.

Key elements: partnership, funding

2) **The lighthouse teacher**

A passionate teacher takes the initiative and dedicates a huge part of her time coordinating the project, collaborating with researchers, and engaging students along with her colleagues.

Key elements: dedicated teacher, teamwork

3) **Co-creating the garden**

Researchers regularly visit the school to kick in the co-creation process. They share knowledge about biodiversity, while learning from students' perspectives on nature and their ideas about how to improve the garden.

Key elements: mutual learning

4) **Growing ownership & values**

Students spend more time outdoors and take care of the garden, while developing ownership over it, and cultivating nature- and community-related values.

Key elements: engagement, hands-on learning

5) **Transforming the school**

As the garden becomes part of the school's everyday life, organisational practices start to emerge that change not only the school's surroundings, but also the mind- and skillsets of students, teachers, and researchers alike.

Key elements: institutional change, shift in mindsets

6) **Nurturing values & behaviour**

Intervention methods – such as arts-based approaches and reflexive learning – are applied to explore how the garden influences values and behaviors. Through open discussion, creative expression, and self-reflection, they deepen students' connection to nature and cultivate a shared understanding of sustainability.

Key elements: reflexive learning, arts-based methods

7) **Cultivating a bright future**

Over the years, the garden flourishes, drawing many children closer to nature, while contributing to research on nature connectedness and the related values.

Key elements: lasting transformation, long-term engagement, new research insights

Lessons learned:

• **Empower educators & schools**

- Learn from "lighthouse teachers" and their best practices in biodiversity education. *Change agents: school communities.*
- Develop, disseminate and provide related teaching materials, toolkits, and trainings. *Change agents: researchers, NGOs.*
- Help in connecting to peer-learning networks (e.g. the Hungarian Foundation for School Gardens) to support teachers in implementing school gardens and other best practices in biodiversity education. *Change agents: school communities, NGOs.*

- Encourage integrating nature-based (outdoor) learning across subjects and school community events. *Change agents: school communities, educational policy.*
- **Experiential learning for students**
 - Encourage and expand participatory projects – either through action research or community initiatives – to include more schools, allowing students to co-create their learning environments. *Change agents: educational policy.*
 - Integrate biodiversity education across all subjects and grades to support a holistic worldview, rather than limiting it to specific age groups and disciplines. *Change agents: educational policy.*
 - Develop biodiversity-focused experiential learning programmes that align with the curriculum while enabling creativity. *Change agents: school communities.*
 - Foster a deeper connection to nature among students through hands-on learning methods, leading to long-term behavioral change. *Change agents: school communities.*
- **Community and parental involvement**
 - Engage parents and local communities in school garden activities, fostering intergenerational learning and strengthening community ties. This may also encourage sustainable food practices at home and inspire community gardens. *Change agents: school communities, local communities, NGOs.*
 - Create partnerships with local farmers, conservationists, and businesses to strengthen sustainable school gardens. Municipal and NGO support can provide resources, knowledge, and financial backing to maintain and expand school gardens. *Change agents: local communities, NGOs.*

Guidance for stakeholder groups

Guidance for school communities: What can you do as a teacher, student or parent?

- Learn from "lighthouse teachers" and their best practices in biodiversity education.
- Help in connecting to peer-learning networks (e.g. the Hungarian Foundation for School Gardens) to support teachers in implementing school gardens and other best practices in biodiversity education.
- Encourage integrating nature-based (outdoor) learning across subjects and school community events.
- Develop biodiversity-focused experiential learning programmes that align with the curriculum while enabling creativity.
- Foster a deeper connection to nature among students through hands-on learning methods, leading to long-term behavioral change.
- Engage parents and local communities in school garden activities, fostering intergenerational learning and strengthening community ties. This may also encourage sustainable food practices at home and inspire community gardens.

Guidance for NGOs and researchers: What can science and civil society do?

- Develop, disseminate and provide related teaching materials, toolkits, and trainings.
- Help in connecting to peer-learning networks (e.g. the Hungarian Foundation for School Gardens) to support teachers in implementing school gardens and other best practices in biodiversity education.
- Engage parents and local communities in school garden activities, fostering intergenerational learning and strengthening community ties. This may also encourage sustainable food practices at home and inspire community gardens.
- Create partnerships with local farmers, conservationists, and businesses to strengthen sustainable school gardens. Municipal and NGO support can provide resources, knowledge, and financial backing to maintain and expand school gardens.

Guidance for policymakers: How can you help from the policy side?

- Encourage integrating nature-based (outdoor) learning across subjects and school community events.
- Encourage and expand participatory projects – either through action research or community initiatives – to include more schools, allowing students to co-create their learning environments.
- Integrate biodiversity education across all subjects and grades to support a holistic worldview, rather than limiting it to specific age groups and disciplines.

Guidance for local communities: How can you help if you live and/or work in the school neighborhood?

- Engage parents and local communities in school garden activities, fostering intergenerational learning and strengthening community ties. This may also encourage sustainable food practices at home and inspire community gardens.
- Create partnerships with local farmers, conservationists, and businesses to strengthen sustainable school gardens. Municipal and NGO support can provide resources, knowledge, and financial backing to maintain and expand school gardens.

	Actions to take	School comm-unities	NGOs & resear-chers	Policy-makers	Local comm-unities
Empower educators & schools	Learn from "lighthouse teachers" and their best practices in biodiversity education.	x			
	Develop, disseminate and provide related teaching materials, toolkits, and trainings.		x		
	Help in connecting to peer-learning networks (e.g. the Hungarian Foundation for School Gardens) to support teachers in implementing school gardens and other best practices in biodiversity education.	x	x		

	Encourage integrating nature-based (outdoor) learning across subjects and school community events.	x		x	
Experiential learning for students	Encourage and expand participatory projects – either through action research or community initiatives – to include more schools, allowing students to co-create their learning environments.			x	
	Integrate biodiversity education across all subjects and grades to support a holistic worldview, rather than limiting it to specific age groups and disciplines.			x	
	Develop biodiversity-focused experiential learning programmes that align with the curriculum while enabling creativity.	x			
	Foster a deeper connection to nature among students through hands-on learning methods, leading to long-term behavioral change.	x			
Community and parental involvement	Engage parents and local communities in school garden activities, fostering intergenerational learning and strengthening community ties. This may also encourage sustainable food practices at home and inspire community gardens.	x	x		x
	Create partnerships with local farmers, conservationists, and businesses to strengthen sustainable school gardens. Municipal and NGO support can provide resources, knowledge, and financial backing to maintain and expand school gardens.		x		x

Our evidence base

As part of the EU-funded PLANET4B project, the transformative potential of Hungarian biodiversity education was assessed through a critical systemic analysis, key informant interviews, and various participatory methods – such as participatory theatre and interactive biodiversity lessons – applied in school gardens. Using an intersectional approach, we conducted fieldwork in three distinct school contexts and collected data through questionnaires, (participatory) observation, debriefing sessions, and photovoice studies. The research was supported by our stakeholder board, composed of experts in environmental education in Hungary.

Our transformative change story focuses on a school garden co-created through a participatory action research project involving researchers, teachers, and students. A 'lighthouse' teacher, a supportive school principal, and the surrounding natural environment played key roles in enabling transformative change, while the broader political structures in Hungary present ongoing challenges.

What should we wear on a planet in peril? Twelve key messages about transformative change for fashion and biodiversity (Annex 13)

Story of Transformative Change: From "egosystem to ecosystem" (Italy)

Authors: Marta Bonetti, Pedro Navarro Gambín, Matteo Villa

About this document

This document highlights the research findings on fashion and biodiversity, conducted as part of the PLANET4B project, by our team at the University of Pisa.

Inside, you will find a concise executive summary and twelve key messages to provide you with quick access to essential information.

This document is designed for everyone engaged in promoting ecological change in the fashion industry.

Whether you're a student, an environmental or social activist, a consumer, a trade union member, an entrepreneur, a policymaker, or simply someone curious about making a difference.

Our research

Our research delves into the critical relationship between biodiversity and the textile, apparel, and fashion industry (TAF). We aim to identify pathways through which the fashion sector can transform to halt and reverse biodiversity loss.

Fashion is a global industry with high environmental and social impact, and enormous financial resources. Given its cultural relevance, positive changes within the sector could foster wider societal transformations. However, despite its importance, the connection between biodiversity and the fashion system has largely been overlooked in academic literature and recent EU policies.

Our study is based on over 30 interviews with experts, an analysis of documents published by companies, business organisations, consultancies, and private research institutes; and future visioning workshops with key actors. We have also examined the efforts of three small to medium-sized fashion companies that are making significant strides toward sustainability by focusing on quality, sufficiency, and responsible practices.

We hope this document serves as an inspiration!

Executive summary

What is biodiversity and why is it so important

Biodiversity, or biological diversity, refers to the richness of life on Earth. Put it simply, biodiversity includes all living organisms – millions of animals and plants – their habitats and ecosystems, and the way in which they interact with each other. While species extinction can be a natural occurrence, recent estimates indicate that biodiversity is currently declining at a pace thousands of times faster than usual due to human action.

We are losing pieces. Biodiversity loss in numbers:

- 8 million: total estimated number of animal and plant species on Earth, including 5.5 million insect species (Diaz and Malhi, 2022).
- Up to 1 million species threatened with extinction, many could face it within decades (IPBES, 2019).
- 73% in species population reduction since 1970 (WWF, 2024).
- 290 million hectares native forest cover lost from 1990–2015 due to clearing and wood harvesting (IPBES 2019).
- 100–300 million people in coastal areas at increased risk due to loss of coastal habitat (IPBES, 2019).

Figure 1. Data on biodiversity loss.

The decline of biodiversity has significant consequences for the health of entire ecosystems and our ability to adapt to a changing environment. We are endangering the basis of our livelihoods, food security, health, and overall quality of life around the world.

Placing the biodiversity and nature loss crisis at the forefront of our agenda is more urgent than ever.

The fashion system

The textile, apparel and fashion (TAF) industries are among the most exploitative and unjust sectors globally. This is largely due to their intensive use of natural resources and reliance on low-cost labour (Hachfeld and Schenk, 2024).

The spatial and functional distribution of the fashion industry is fragmented and globalised, revealing stark power imbalances within the supply chains of both the fast fashion and luxury brands. These disparities are evident in the relationships between brands and suppliers, the economic divide between the Global North and the Global South, and in the dynamic between companies and governments.

The sector's short-term business strategy is mainly based on a combination of reduced prices and increased sales volumes. Profit margins are maximised at the expense of social and environmental impacts, and sustainability is often considered a costly additional feature. Low prices lead to increased consumption, speed and quicker obsolescence of the items, nourishing a 'consumerism culture' that values immediacy and novelty.

Fashion and biodiversity

The fashion industry has a profoundly damaging impact on global biodiversity, influenced by both direct and indirect factors or drivers (Navarro Gambín et al., 2025). Regarding the direct drivers:

Land-use change

A considerable proportion of fashion's impact on biodiversity results from habitat change caused by agriculture and the intensive use of pesticides to produce cotton, viscose, wool, rubber, and leather. Fashion strongly contributes to deforestation.

Pollution

While the full extent of fashion's contribution to pollution is unknown, estimates suggest that 20% of global freshwater pollution comes from the wet processing of the textile industry (Granskog et al., 2020). This processing involves various water- and chemical-intensive processes, including scouring, bleaching, dyeing, printing and finishing of raw textiles.

Climate change

TAF industries were the fourth largest emitter of CO₂ in 2016, accounting for 8.1% of global greenhouse gas (GHG) emissions (Quantis, 2018). Approximately 52% of fashion's GHG emissions come from the production of raw materials and the preparation of fabric and yarn. Emissions are driven by the fashion industry's massive use of synthetic oil-based materials such as polyester.

These factors reflect underlying causes rooted in how societies organise themselves and interact with nature, such as our economic models and patterns of production and consumption, i.e. indirect drivers. Current practices are still based on the belief in the endless availability of natural resources and the pursuit of continuous economic growth, a belief that persists today, despite evidence of planetary boundaries that have already been transgressed (Richardson et al., 2023).

As the production and consumption of textile products continue to grow, their impact on biodiversity increases. While technical solutions, energy source substitution (such as renewables) and improved efficiency could lessen the environmental impact per unit, these benefits will be offset by the increasing volumes.

The more is not the better. Fashion in few numbers:

- From 2000 to 2022 global fibre production doubled (from 58 million to 116 million tonnes). It is expected to reach 147 million tonnes by 2030 (Textile Exchange, 2023).
- Synthetic fibres made 65% of global fibre production in 2022. Polyester is 54% of the total (Textile Exchange, 2023).
- Textile production increased from 5.9 kg/pc in 1975 to 13 kg/pc in 2018 (Niinimäki et al., 2020).
- Expenditure on clothing and footwear in the EU and UK has decreased from 30% of the total household expenditure in the 1950s to 5% in 2020 (Niinimäki et al., 2020).

Figure 2. Data on global fiber production and clothing expenditure.

The **'take-make-waste'** linear fashion model significantly contributes to the pressures fashion places on biodiversity loss. The fashion industry generates millions of tonnes of waste every year, with a substantial portion exported from countries in the Global North to those of the Global South (Niinimäki et al, 2020).

Suffocated by waste:

- From 2000 to 2015 consumers disposed 60% of their clothes within a year of buying them (Business for Nature, 2023)
- 92 million tons of textile waste are produced every year (Niinimäki et al., 2020).
- Only 12% of textile waste is downcycled, and less than 1% is closed loop recycled, i.e. recycled into the same or similar quality applications (Niinimäki et al., 2020; Textile Exchange, 2023).
- 73% of the fibre produced in 2015 was incinerated or ended up in landfills (Niinimäki et al., 2020; Wagaw and Babu, 2023).

Figure 3. Data on textile waste and recycling.

12 Key messages for the future of fashion

Our research findings are summarised into twelve short messages highlighting potential strategies for transforming the fashion industry to protect biodiversity. Together, these messages present a vision for a new, biodiversity-friendly fashion sector.

While some of these pathways are specifically relevant for the fashion industry, others are part of a wider transition that may occur in various sectors.

1. Protecting biodiversity becomes a priority in Fashion

Vision: Our perspective is shifted. Nature and biodiversity are no longer seen as merely resources for human exploitation and consumption. Instead, they are now recognised as a complex, interconnected system where all living beings, humans included, and their environment harmoniously coexist. Biodiversity is valued, conserved, restored and wisely used to benefit both people and the planet.

2. Reducing the volumes of production and consumption

Vision: We cannot grow indefinitely on a finite planet. The flow of new products entering the market has notably slowed. The number of seasonal fashion collections has decreased, and marketing campaigns are limited. However, the quality of clothing is significantly improved; garments are designed to last, and our desires have finally shifted. We are starting to value what we already own, and our urge to buy more and more items is fading.

3. Encouraging a transition to agroecology in fashion's agriculture

Vision: Fashion relies on natural raw materials that are cultivated within fair and sustainable farming systems that utilise agroecological practices to regenerate the health of natural ecosystems. No new natural areas are converted into farmland or plantations, and hazardous, non-degradable chemicals are eliminated.

4. Promoting a shift in the production materials

Vision: Fashion minimises its dependence on virgin materials and is actively working toward phasing out fossil fuel-based materials and plastics.

5. Supporting the circularity of textiles, clothing materials, and apparel

Vision: The use of garments is significantly extended. Repair services are accessible and affordable, and skills in mending and care are widely shared. At the end of their life cycle, garments and their materials are recovered and recycled. Products are designed for recyclability, and fabric-to-fabric recycling is supported to create closed production cycles. The number of products sent to landfill or incinerated is minimised, ensuring low environmental impacts and safe jobs.

6. Ensuring sustainable water and chemical use

Vision: Water resources are used sustainably throughout the entire production cycle. The fashion industry protects ecosystems and meets human water needs without causing any further water stress.

7. Fostering changes in fashion business models towards circularity, sufficiency, and regeneration. Support small and local enterprises

Vision: Fashion companies are building meaningful relationships with local communities and traditions, while embracing high labour and environmental standards. With a commitment to quality over quantity, they are shifting away from profit-maximising business models. Their focus on sustainable practices reflects a thoughtful balance among profit, labour, land use, and productivity, prioritising responsible craftsmanship.

8. Providing safe and fair conditions for workers and local communities.

Vision: Jobs are regulated to minimise the risk of precarious and exploitative working conditions. All workers benefit from the full range of labour rights and receive robust social protection. Trade unions and labour organisations amplified their voices, shifting power relations in the sector away from the most powerful brands and corporations towards democratic and equitable industrial relations and trade practices.

9. Moving away from voluntary governance to legally binding regulations across areas.

Vision: A regulatory framework is setting the industry on a path of transformation, moving beyond private initiatives and business self-organisations, which have proved inadequate, while supporting companies that adopt sustainable business models.

10. Understanding the interdependencies between fashion and biodiversity.

Vision: Increased research, skills, knowledge, networks of individuals and organisations, as well as public action plans, support business transition towards sustainability and biodiversity conservation.

11. Improving transparency, traceability and accountability throughout the entire supply chain.

Vision: All business actors, including brands, producers, sellers, brokers, are accountable for their social impacts and effects on biodiversity throughout the long and complex supply chains.

12. Strengthening vertical and horizontal collaboration between actors, institutions, levels and scales of government.

Vision: Public action plans support top-down initiatives from institutions, as well as bottom-up, self-organised efforts, to improve the governance of the new fashion system at local and global levels. The system is funded on a virtuous combination of collaborations and cooperation, rather than on maximising competition.

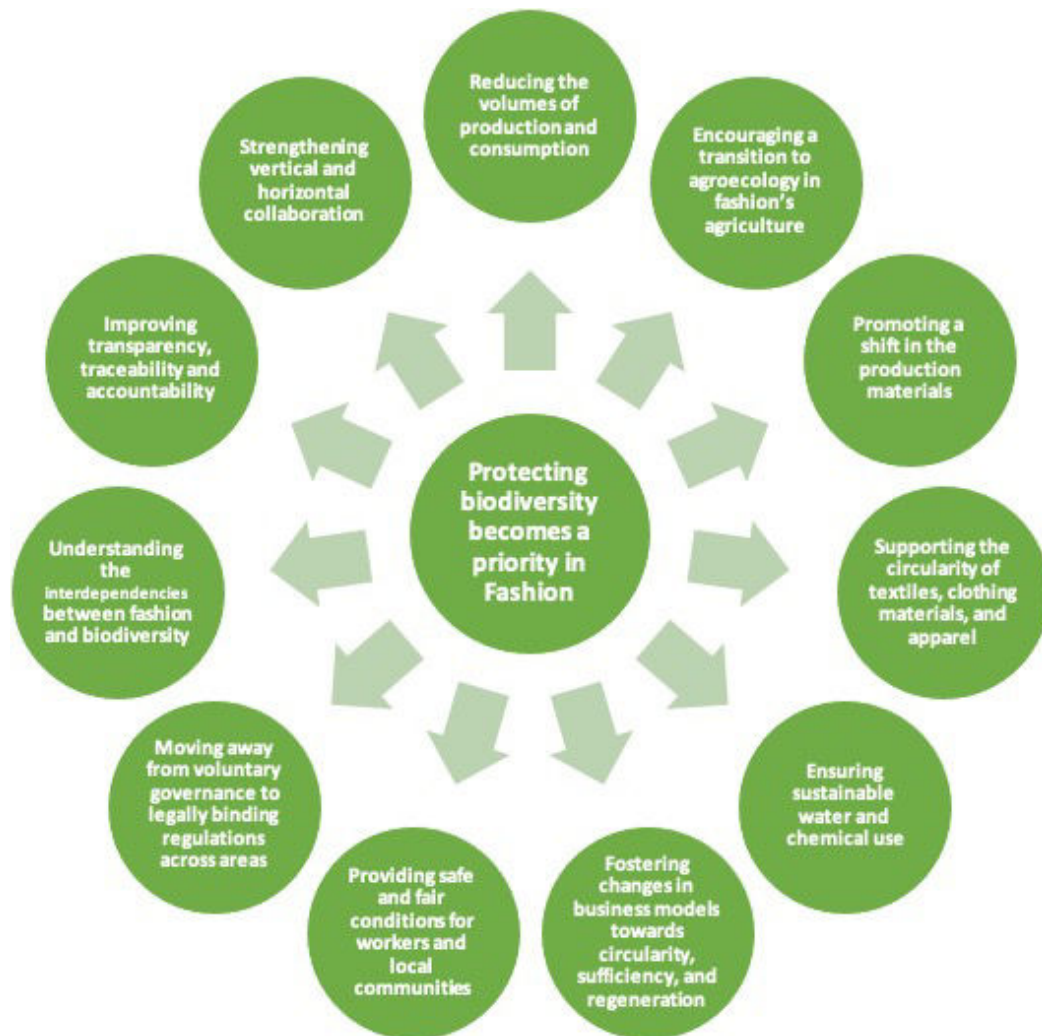


Figure 4. Priority actions for transforming the fashion sector.

Further resources

Video (English) “[PLANET4B – Moda e biodiversità – La ricerca](#)”

Video (Italian) “[PLANET4B | Moda e biodiversità – Consigli per gli acquisti](#)”

References

- Business for Nature (2023). Fashion and apparel: Priority actions towards a nature-positive future. https://static1.squarespace.com/static/5d777de8109c315fd22faf3a/t/65e6d2b303d0046ded0844fe/1709626044517/Fashion_Full+Report.pdf
- Díaz, S., & Malhi, Y. (2022). Biodiversity: Concepts, Patterns, Trends, and Perspectives. *Annual Review of Environment and Resources*, 47(1), 31–63. <https://doi.org/10.1146/annurev-environ-120120-054300>
- Granskog, A, et al (2020). Biodiversity: The next frontier in sustainable fashion. McKinsey & Company. <https://www.mckinsey.com/industries/retail/our-insights/biodiversity-the-next-frontier-in-sustainable-fashion>
- Hachfeld, D., & Schenk E. (2024). One-Earth Fashion: 33 Transformation Targets for a Just Fashion System within Planetary Boundaries. A Public Eye Report. https://www.publiceye.ch/fileadmin/img/Mode/One_earth_fashion/One-Earth_Fashion_Full_Report_2024.pdf.
- IPBES. (2019). Summary for policymakers of the global assessment report on biodiversity and ecosystem services. Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). <https://doi.org/10.5281/zenodo.3553579>
- Navarro-Gambín, P., Bonetti, M., Villa, M., Brunori, G., & Vergamini, D. (2025). Paving the Ground for Biodiversity-Positive Transformative Change in Fashion: An Exploration of Drivers of Biodiversity Loss and Barriers to Transformative Change in the Textile, Apparel, and Fashion Sector. *International Journal of the Commons*, 19(1), 322–341. DOI: <https://doi.org/10.5334/ijc.1458>
- Quantis (2018). Measuring Fashion. Environmental Impact of the Global Apparel and Footwear Industries Study. https://catalogue.unccd.int/1359_measuringfashion_globalimpactstudy_fullreport_quantis_cwf_2018a.pdf
- Richardson, K., et al. (2023). Earth beyond six of nine planetary boundaries. *Science advances*, 9(37), eadh2458. DOI: [10.1126/sciadv.adh2458](https://doi.org/10.1126/sciadv.adh2458)
- Textile Exchange (2023). Materials Market Report. <https://2d73cea0.delivery.rocketcdn.me/app/uploads/2023/11/Materials-Market-Report-2023.pdf>
- Wagaw T, Babu KM. (2023). Textile Waste Recycling: A Need for a Stringent Paradigm Shift. *AATCC Journal of Research*. 2023;10(6), 376–385. DOI: [10.1177/24723444231188342](https://doi.org/10.1177/24723444231188342)
- WWF. (2024). Living Planet Report 2024. A system in Peril. WWF. <https://wwflpr.awsassets.panda.org/downloads/2024-living-planet-report-a-system-in-peril.pdf>

Fostering biodiversity-friendly farming practices in a sector that relies on labour migration (Annex 14)

Story of Transformative Change: Agriculture and migration (EU)

Authors: Lina Tennhardt, Liene Hennig, Mahsa Bazrafshan

Current situation: Identifying the system that needs to be transformed

Quote from a German asparagus farmer: “Many of these environmental protection approaches cost money, [...] and then you would need more labour, yes. That’s the way it is. Or it’s difficult. Or it’s expensive. And we must never forget that we still have to produce at the world market price.”

Intensive agricultural production is one of the main drivers of biodiversity loss. Simultaneously, agriculture relies on functional biodiversity to deliver a variety of ecosystem services. Therefore, transforming farming landscapes to increase their diversity and provide valuable habitats for wild flora and fauna is essential. Nevertheless, the implementation of appropriate agricultural practices, such as reducing the use of harmful plant protection products, establishing and maintaining diverse field margins, and increasing the variety of cultivated crops, is hindered by various factors. These include cultural norms, market structures and labour-related issues.

Certain biodiversity-friendly farming practices are indeed highly labour- and knowledge-intensive. For example, highly diversified farming systems require agricultural workers to have more crop-specific knowledge and to make more independent decisions. In vegetable and fruit production, for example, not using herbicides can mean extra hours of manual weeding due to the limited availability of mechanical weeding options, which are often affected by weather conditions, crop specifications and topography. In Europe, these manual tasks in vegetable and fruit production are primarily performed by seasonal migrant workers. They are usually employed for a few months, typically during the harvesting season, and often experience dependency and precarious working conditions. Therefore, when focusing on migrant labour, the labour dimension of biodiversity-friendly farming systems also raises questions of social sustainability.

Although biodiversity-friendly farming systems yield many benefits for humans, they are not inherently socially sustainable. Social and environmental sustainability are closely linked, and neither can really exist without the other. Therefore, when transforming farming systems to make them more biodiversity-friendly, it is also necessary to address questions regarding labour requirements and availability, as well as considering the potential implications for labour organisation and working conditions.

Future vision: What should a transformed system look like?

Interviewer: "What is an ideal farm for you?"

Swiss vegetable farmer (01): I think it's the best question anyone could ask us. It's that the people who work here get on well, so that they have a good working atmosphere, that the crops look good. Then we need to have nice customers who want our products because it's good, and there have to be enough customers for us to sell everything. If we were to do that, we'd be in the best of all possible worlds, because afterwards it means that we have enough finances to be able to replant, to be able to do biodiversity, maybe use solar energy or change to electric tractors. If any of these things go wrong, we won't be able to move towards biodiversity, towards a better world."

A promising vision for the future of agriculture and migration is one that encompasses a variety of locally adapted agricultural systems, all of which are guided by a shared commitment to environmental responsibility and social justice. Biodiversity is integral to farm management and systems and is essential for the future of farming and agricultural landscapes. These diverse, locally adapted farms provide healthy habitats that support thriving local fauna and flora, while producing a variety of crops and other resources for human consumption.

Good Food Work (Klassen et al., 2023) is recognised as an integral component of sustainability and a well-established standard. This means that farm workers are employed on regulated shifts, paid fair wages and able to voice their opinions and participate in decision-making processes, free from the structural weaknesses caused by financial and legal dependency or racialised attributions. Farmers have the financial and organisational leeway to provide these working conditions and are not dependent on a system that exploits lower wages in other countries.

The expertise of farm workers is recognised and valued. The acquisition and transmission of biodiversity-relevant knowledge is encouraged and supported in all interactions, for example, between farm managers and farm workers. Agricultural mechanisation and digitalisation do not pose a threat to biodiversity or weaken the position of farm workers – for instance, by exerting power and control over working pace. Instead, as agricultural technologies alleviate tedious physical labour and reduce or replace the use of harmful plant production products, thereby supporting diversified production systems at all scales. Additionally, resilience is crucial – socially, environmentally, and culturally embedded farms are better equipped to adapt to climate change and global crises.

Pathways: Towards the transformed agricultural systems

Interviewer: "What do you think, why is it so easy for you to find new employees, that you are even regularly contacted by people asking for work?"

Swiss vegetable farmer (02): "I think it's that diversity. It's clear that it's a place that will attract people to work because you change tasks a lot. It's

very diverse. You don't get bored, you don't go out in the morning and cut 50 pallets of salad, that's it, or pick cucumbers all day. I think that's more attractive. In addition, I think the working conditions are a bit better than elsewhere. Direct selling enables us to keep the added value on the farm, so we can also afford to pay a bit better wage than the minimum required in agriculture. There's a good atmosphere, maybe that's part of it too."

In this section, we compile a selection of the barriers to and enablers of the envisaged change that we identified. Although this list is not exhaustive, it encompasses the most significant aspects that emerged from our research. As shown in Figure 1, these enablers (purple) and barriers (green) contribute to shaping and guiding the pathways from the current system to the transformed one.

Enablers

Direct selling channels: Most farming systems that engage in direct selling grow a wide variety of crops to meet their customers' demands. These systems also offer a variety of tasks, which may make the work more appealing to potential farm workers compared to specialised farms. As farmers can retain more of the added value on their farms, they are often able to pay better wages.

Knowledge transmission: Migrant farm workers accumulate farm-specific knowledge and skills over the course of their years of experience, often progressing to more responsible positions. Sometimes, farm workers view working abroad as an opportunity to gain agricultural knowledge that they can apply in their home countries. Therefore, there is potential to foster processes of knowledge acquisition and exchange between farmers and farm workers, particularly since biodiversity-friendly farming tends to be a knowledge-intensive practice. Farm workers should have access to training that improves their understanding of the context of their work. This training should inform them of their rights and enable them to develop skills in agriculture and biodiversity-related topics. Ideally, it should also provide them with the opportunities and qualifications needed for long-term work relationships.

Regulations and subsidies: Several schemes that support biodiversity-friendly farming by providing subsidies are already in place, encouraging farmers to improve their biodiversity management. Direct payments under the CAP have recently been linked to labour standards, combining environmentally friendly farming practices with social responsibility. A coherent European framework that incorporates environmental integrity and social justice could further support biodiversity-friendly farming practices, fair labour conditions and robust rights protections for farmers and wage workers, respectively.

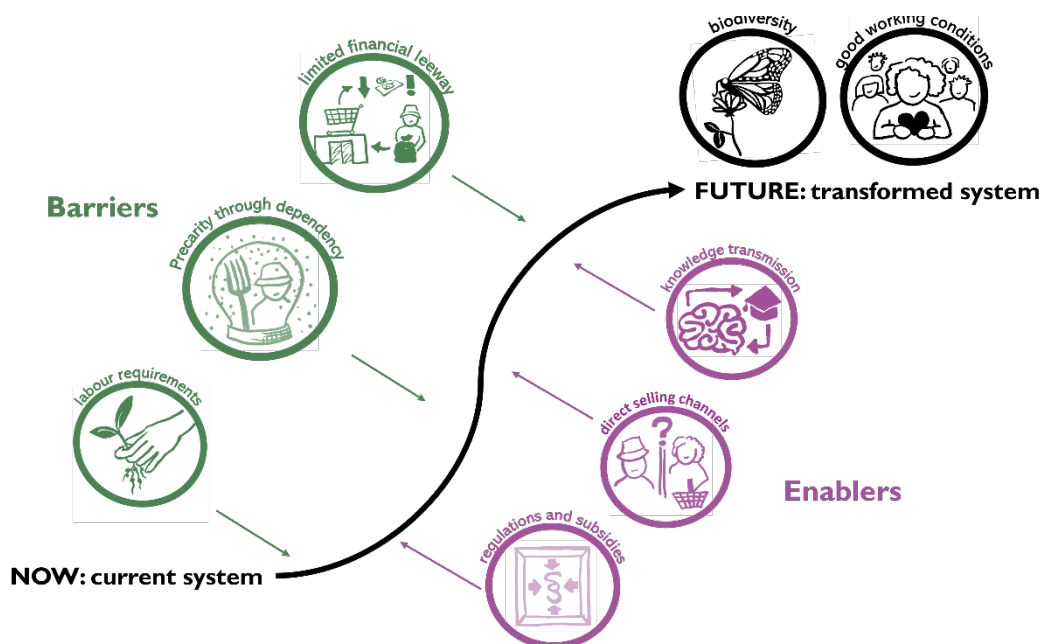


Figure 3. Identified opportunities and barriers for achieving better biodiversity outcomes while ensuring good working conditions in agriculture.

Barriers

Limited financial leeway: The price pressure exerted by retailers, coupled with consumers' limited willingness to cover the additional costs of biodiverse and socially just production methods, as well as national and international competition, restricts farmers' financial leeway. This promotes specialisation, farm consolidation and agricultural intensification.

Precarity through dependency: The seasonal and time-sensitive aspects of farming activities normalise and justify poor working conditions for farmers and farm workers in agriculture. Migrant workers are particularly vulnerable to precarious and exploitative conditions due to factors such as limited contract lengths, language barriers and structural disempowerment (Rye & Scott, 2018). However, although reliance on labour migration is often criticised, the systems themselves are rarely fundamentally questioned, and alternatives are seldom considered. There is also a general issue with the attractiveness of employment in the sector beyond labour migration.

Labour requirements: Implementing biodiversity-friendly farming measures requires more manual labour. These measures also require farm workers to make more independent decisions and possess specialised skills. However, there is a shortage of specialist staff, so farmers rely heavily on migrant workers for manual labour.

The evidence basis

Our understanding of the described system is largely based on a qualitative analysis of semi-structured interviews with specialist crop farmers and farm workers. As part of the 'Agriculture and Migration' case study of the Horizon Europe PLANET4B project, we conducted open-ended interviews with 18 Swiss vegetable farmers, six German asparagus farmers, three British strawberry farmers, seven Romanian farmers with a migration background and eight Polish farm workers employed on Swiss farms. The

qualitative analysis focused on understanding the multiple interlinkages between biodiversity management and migrant labour within the farming system.

Additionally, four interactive workshops were held with stakeholders in Germany (six participants), Switzerland (eight participants), Romania (ten participants) and the UK (four participants). These provided insight into structural barriers and levers for biodiversity-friendly farming, as well as offering general insights into agricultural labour systems. We also discussed future visions and potential leverage points that could support transformative change in the envisaged system at an expert workshop.

Further knowledge resources

FiBL-Podcast „Feldarbeit ohne Grenzen“ (German) [FiBL – Podcast: Feldarbeit ohne Grenzen – Arbeitsmigration in der Landwirtschaft](#).

“Aufwändig und wissensintensiv – Arbeitsanforderungen für mehr Biodiversität in Spargel- und Gemüsebetrieben” Artikel in Fachzeitschrift für Ländliche Räume [Agrarsoziale Gesellschaft e.V. – Zeitschrift Ländliche Räume](#). Work in Progress.

Peer-reviewed publication “Understanding the role of labour migration for on-farm biodiversity management: a case of fruit and vegetable production”. Work in Progress.

References

- Klassen, S., Medland, L., Nichol, P., & Pitt, H., 2023. Pathways for advancing good work in food systems: Reflecting on the international Good Work for Good Food Forum. *J. Agric. Food Syst. Community Dev*, 1–17. <https://doi.org/10.5304/jafscd.2023.122.004>
- Rye, J. F., & Scott, S., 2018. International Labour Migration and Food Production in Rural Europe: A Review of the Evidence. *Sociologia Ruralis*, 58, 928–952. <https://doi.org/10.1111/soru.12208>

Agenda: Transformative Change Stories – cross-case meeting WS1 (Annex 15)

Transformative Change Stories (TCS) – cross case meeting WS1

16th of January 2025, 9:00 – 11:00 (CET), virtual via Zoom:

<https://us02web.zoom.us/j/88646372136?pwd=bOvGNauuZ7LDewyAJfgEivv5TVQcwO.1>

Aims of the Workshop:

- Inspiration and exchange of ideas for TCS between case study teams
- Reflections/feedback on already existing plans for TCS
- Clarifications of capacities and support needs for

9:00 – 9:15	Short introduction What will we do today? Google survey [infographics, video/film, picture (exhibition), story map, written material (booklet, flyer, presentation slides, publication, etc.), other] “Transformative Change Stories” (how should they look like, general structure, various contexts => different purposes), general overview/timeline; deliverable
9:15 – 9:40	What transformative change/parts of transformative pathways are we addressing in our stories? 2 break-out groups: A) place-based cases, B) sector-based cases
9:40 – 10:10	In which formats do we plan to elaborate our stories? Share in break-out groups already envisaged plans.
10:10 – 10:40	„Critical friends“ reflections Partners ask critical questions from target audiences' perspectives.
10:40 – 10:55	Market Place for mutual support What support/skills/expertise can I offer? – Which support do I need? Good practice examples Open Questions
10:55 – 11:00	Next Steps

Agenda: Transformative Change Stories – cross-case meeting WS2 (Annex 16)

Transformative Change Stories (TCS) – cross-case meeting WS2

22nd of April 2025, 10:00 – 13:00 (CET), virtual via Zoom

<https://us02web.zoom.us/j/89460997801?pwd=AYhB7YGO2mPmWeBsDPDmtQepdFKth7.1>

Aims of the Workshop:

- Inspiration and exchange of ideas for TCS between case study teams
- Reflections/feedback/questions on TCS
- Timeline and deadlines: story launch and report for the Compilation of TCS (D3.3)
- Clarifications and support needs for next steps

10:00 – 10:20	Getting started: PLANET4B (Easter) egg hunting competition Short introduction
10:20 – 11:35	Story Sharing: What transformative change/parts of transformative pathways are we addressing in our stories? What are our key messages?
11:35 – 11:50	Break & Fixing dating appointments
11:50 – 12:50	TCS Dating: What can we learn from each other? Where do we identify similarities? How to create synergies?
12:50 – 13:00	Closing (Open questions, support needed, reminder deadlines, template for D3.3 inputs, Alternet-conf.)
THANK YOU!	

*Guidance for Documentation of the Systematisation of Experience
(Annex 17)*

Systematisation of Experience

Internal documentation

Case Study Name

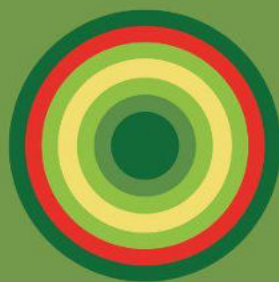
Name Surname^{1}, Name Surname^{2,3}, Name Surname³*

¹ Affiliation 1

² Affiliation 2

³ Affiliation 3

March 2025



PLANET4B

List of abbreviations and acronyms

SoE Systematisation of Experience

Table of Contents

List of abbreviations and acronyms.....	140
Set-up of the Systematisation.....	142
Context.....	142
PLANET4B project context.....	142
Institutional context	142
Policy context	142
Social context	142
Framework for Systematisation.....	142
Objectives	143
Subject	143
Central Aspects	143
Outcomes.....	143
Reconstruction of experience.....	143
Critical analysis	143
Conclusions and lessons learnt.....	144
Learnings	144
Recommendations	144
Communication of results	145
Reflection on the ‘Systematisation of Experience’ method.....	145
References.....	146
Statement on data availability.....	146
Statement on ethics	146
Annex	147
Activity Plan.....	147
Workshop Agendas.....	148
Reconstructed History.....	148
Various documentation materials from your SoE workshops.....	148

Set-up of the Systematisation

Brief overview of how the SoE was implemented:

- Facilitation team
- Description of the implementation process
 - How were the workshops implemented?
 - When?
 - Who participated?⁵

Documentation, such as activity plans, workshop agendas, chronological reconstruction⁶ and photo documentation, is to be included in the Annex.

Context

Please briefly describe the initial situation of the context of your case study, resp. of the intervention experience you have analysed with the SoE. You may refer to various context dimensions – as relevant to your intervention experience, such as:

PLANET4B project context

What was specific because the case/intervention was implemented within the EC-funded PLANET4B project?

Institutional context

This may refer to your own organisation, the Learning Community, and other stakeholders relevant to your case / intervention experience; structures, cooperations, networks, etc.

Policy context

Relevant policy frameworks, strategies, or regulations that (were) influenced (by) your intervention.

Social context

That may refer to relevant societal aspects of your case as well as social aspects of relevance for the members of your LC. You also may explain social relationships and power dynamics

Framework for Systematisation

Please describe briefly how you have elaborated on the framework and who was engaged in this work.

⁵ External participants anonymised, e.g. representative (f – female / m – male / d – diverse) of city department, educator, diversity expert, artist, etc.

⁶ You may include the documentation in whatever format you used: tables, graphics or link to electronic boards.

- Did the facilitation team set the framework alone or did you engage LC participants in the elaboration? Did you collect feedback from LC participants (and refine the framework accordingly)?
- How did you decide on the chosen Subject(s)?
- How did you come up with the central aspects?
- How does the framework refer to your plans of generating a 'transformative change story' (TCS)?

Objectives

What was the specific purpose of your SoE? What did you want to achieve with the SoE learning process? What did you expect to gain from the SoE?

You may also think about if you had a specific product (maybe sth. in addition to the transformative change story; sth. to be shared with a specific target group).

Subject

Which specific part of your experience did you systematise? What was your reflection and analysis subject (thematically, timewise, actor group, scale)?

Why was this of specific interest to you?

Central Aspects

The 'central aspects' provide the focus of the systematisation. What exactly did you pay attention to? What part/perspective of your intervention experience were you particularly interested in? Why were these of most significant interest to you?

Outcomes

Please describe briefly the process and outcomes of each step of your SoE Process.

Reconstruction of experience

This step retrieved information about the history of your intervention experience. Describe how you compiled the information to reconstruct your experience:

- Did you use records that describe the experiences? (reports, minutes, notes, photos, videos, etc.)
- Memories of those who participated in the experience: participants described the experience from their personal points of view
 - Did you include a barometer in the reconstruction? Which guiding questions did you use?

Please include documentation of the reconstruction / compiled history of experience in the Annex.

Critical analysis

Turning points and significant elements

In this step, you identified turning points (where did the process change) and significant elements (important elements which changed):

- How did you identify the turning points and significant elements of your intervention experience? (brief description of the process/setting)
- Description of the identified turning points:
 - What exactly happened at the turning point? Why did you do what you did at that point? Would there have been other options? Why didn't you do it differently?
- Definition of significant elements
 - How did the significant elements develop during the intervention experience?
 - What change in the critical elements occurred at the turning points? (this could refer either to positive or negative impacts on reaching the goal(s) of your intervention)

Analysis of reasons for change

This step was dedicated to analysing why change regarding the significant elements took place (could be positive or negative concerning the goal(s) of your intervention). Maybe you identified several significant elements which could not all be discussed and then clustered and/or prioritised them for the analysis.

- Brief description of the process of clustering, prioritisation and analysis
- Which circumstances or constellations were helpful for change?
- Which were hindering?

Please also consider the context:

- Were there changes in the context during the intervention? How did this affect the history/activity of the intervention?

Conclusions and lessons learnt

Learnings

What was learned during the experience?

Some guiding questions might be:

- What would you do differently if you would implement the intervention again?
- How did you overcome the difficulties/challenges you faced?

Recommendations

Please describe briefly how the recommendations were generated:

- Do they involve the voices of participants of your SoE? Were they engaged in validating or refining the recommendations?

Formulate recommendations based on the learnings from your SoE:

- What would you recommend to others who want to implement a similar activity?

Your recommendations may also refer to the context of the systematised experience, e.g. policy-relevant messages, and they may concern immediate actions or longer-

term strategies. Your recommendations should be specific enough to guide future interventions, practices, strategies, etc., which may refer to your particular case, your organisation, other institutions, the PLANET4B project or similar undertakings, etc. Please specify the different aspects and actors you address.

Communication of results

‘Transformative Change Story’

Please describe if and how you will use the results of your SoE to generate your transformative change story.

Will you carry out further explorations to validate the SoE outcomes? (e.g. interviews)

Other ways of sharing the lessons learned

In case relevant: Please describe your plans of sharing the findings of your SoE beyond the transformative change stories.⁷ Whom do you want to address, in which way?

Reflection on the ‘Systematisation of Experience’ method

Please reflect critically on the SoE process and its outcomes, e.g.:

- What did you like most in the SoE process?
- What challenges or limitations did you encounter during the SoE process?
- Did the process encourage learning? (from both positive and negative aspects of the experience)
- Were the outcomes valuable?
- Did the analysis provide meaningful conclusions and recommendations to guide future actions or decisions?

⁷ Sharing results within the PLANET4B Consortium is planned either in an online meeting or during our F2F meeting in September.

References

Use APA style for citation and referencing – author(s) and year in the text, if you quote directly, include the page number, use alphabetical order in the list of references. The key is to try to be consistent.

A typical APA reference structure for a journal article:

Author last name, initial(s). (Year). Article title. *Journal Title*, Volume Number (issue or part number, optional), page numbers or paper ID. DOI or URL.

An example:

Alcott, B. (2010). Impact caps: why population, affluence and technology strategies should be abandoned. *Journal of Cleaner Production*, 18, 552–560. DOI:10.1016/j.jclepro.2009.08.001.

See detailed APA instructions and more examples here:

<https://www.utoledo.edu/library/help/guides/docs/apastyle.pdf>.

Statement on data availability

Provide one or two sentences on whether and how the data used to generate this report is available. Make sure databases are available.

Statement on ethics

Provide one or two sentences on whether there were any ethical considerations and how these were addressed.

- If people were interviewed/surveyed make sure informed consent was collected.
- If it was an event, make sure informed consent was collected and when you provide the list of participants make sure people gave consent for their names to be included.
- Describe how General Data Protection Regulation (GDPR) of the European Union (EU), any other relevant national regulations, any institutional guidelines on ethics were followed.
- Include statements on potential conflict of interest.

Annex

Activity Plan⁸

Activity	Who is responsible?	Participants	Resources	Date/time
2. Context				
Outline of the organisational context; societal context; policy context			e.g. Literature review, System mapping	
3. Reconstruction of what has happened				
Document research, viewing and sorting of existing information and minutes				
Preparation of a timeline with some key activities				
Implementation Reconstruction Workshop				
4. Critical analysis				
Preparation Analysis Workshop				
Implementation Analysis Workshop				
Documentation of Workshop-Outcomes				
5. Communication of results				

⁸ You can either copy in the table from your framework document or fill in the table template or simply list an overview of your activities.

Workshop Agendas

Please translate them into English.

Reconstructed History

You can include graphics, tables, links to e.g. Miro, etc. – no need to translate it.

Various documentation materials from your SoE workshops

Pictures, links, graphics, etc.

Guidance for Documentation of Validation Workshops (Annex 18)

Validation Workshop

Internal documentation (T3.3)

Case Study Name

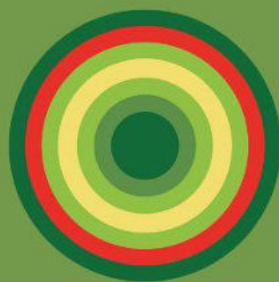
Name Surname^{1}, Name Surname^{2,3}, Name Surname³*

¹ Affiliation 1

² Affiliation 2

³ Affiliation 3

Month 2025



PLANET4B

List of abbreviations and acronyms

TCS Transformative Change Story
WS Workshop

Table of Contents

List of abbreviations and acronyms.....	151
Executive Summary	153
Set-up of the Validation Workshop	153
Workshop Format.....	153
Participant Selection	153
Validation Approach	153
Context.....	153
PLANET4B project context.....	153
Social context	153
Institutional context	154
Policy context	154
Objective(s) of the Workshop	154
Workshop Agenda Overview	154
Key Findings and Results	154
Validated Elements	154
Suggestions for Improvement	154
Issues of Divergence	154
Emerging Themes	154
Conclusions and next steps	154
References.....	155
Statement on data availability.....	155
Statement on ethics	155
Annex	156
Workshop Agenda.....	156
Relevant documentation materials from your Validation WS	156

Executive Summary

This report summarises the outcomes of the Validation Workshop [*please insert if your WS had a specific title*] of the [*name of the case study*] held on [*Date*] at [*Location*]. The workshop was organised as part of the PLANET4B project (T3.3) and aimed to validate key findings/messages and to [*co-develop/refine/etc.*] inputs/core messages for the 'Transformative Change Stories' with [*members of the stakeholder board/stakeholders/other actors*]. A total of [XX] participants attended the workshop, including [*please list main participant groups, e.g. representatives from environmental NGOs, experts, researchers, practitioners, etc.*]. The workshop ...

Please briefly summarise if the workshop mainly confirmed or challenged the presented findings and what it generated – e.g. suggestions, etc.

Set-up of the Validation Workshop

Please give a brief overview of the WS design, and include documentation, such as the workshop agenda, graphics and photo documentation in the Annex.

Workshop Format

General information about the WS setting, e.g. online, personal meeting, facilitation set-up, presentations, plenary, break-out groups, interactive formats, etc.

Participant Selection

Whom did you invite? (e.g. based on previous involvement, specific perspective, representatives of key stakeholder groups, etc.)

Validation Approach

What did the validation focus on? General feedback or more specifically (e.g. relevance, accuracy, feasibility, completeness)?

Context

Please briefly describe the context of your case study. You may refer to various context dimensions – as relevant to your intervention experience, such as:

PLANET4B project context

Please briefly describe how you implemented your case study work within the EC-funded PLANET4B project. Eventually, also refer to previous activities in which the participants of the Validation WS were already involved.

Social context

That may refer to relevant societal aspects of your case, e.g. cultural issues, aspects of justice and intersectionality, power dynamics.

Institutional context

This may refer to organisational settings, governing frameworks, structures, cooperations, networks, coalitions, etc. relevant to your case.

Policy context

Relevant policy frameworks, strategies, or regulations that are addressed in your case.

Objective(s) of the Workshop

What was the purpose of the WS? What did you want to achieve with the validation? What did you expect to gain from the WS? Please briefly describe what was (supposed to be) validated (specific content, format of communicating the TCS, .

Workshop Agenda Overview

Please describe the main steps of the workshop flow and how participants were engaged.

Key Findings and Results

Please give an overview of the workshop results. You can stick with the suggested structure or adjust (as applicable for your findings).

Validated Elements

Please describe what was confirmed by participants.

Suggestions for Improvement

Which recommendations/suggestions for adjustments did you receive?

Issues of Divergence

On which aspects did discussions reveal differing views?

Emerging Themes

Which new ideas emerged during the WS?

Conclusions and next steps

Please describe how you will consider participants' feedback in the next steps (e.g. finalising the TCS), and if, eventually, further actions will be taken.

References

Use APA style for citation and referencing – author(s) and year in the text, if you quote directly, include the page number, use alphabetical order in the list of references. The key is to try to be consistent.

A typical APA reference structure for a journal article:

Author last name, initial(s). (Year). Article title. *Journal Title*, Volume Number (issue or part number, optional), page numbers or paper ID. DOI or URL.

An example:

Alcott, B. (2010). Impact caps: why population, affluence and technology strategies should be abandoned. *Journal of Cleaner Production*, 18, 552–560. DOI:10.1016/j.jclepro.2009.08.001.

See detailed APA instructions and more examples here:

<https://www.utoledo.edu/library/help/guides/docs/apastyle.pdf>.

Statement on data availability

Provide one or two sentences on whether and how the data used to generate this report is available. Make sure databases are available.

Statement on ethics

Provide one or two sentences on whether there were any ethical considerations and how these were addressed.

- If people were interviewed/surveyed make sure informed consent was collected.
- If it was an event, make sure informed consent was collected and when you provide the list of participants make sure people gave consent for their names to be included.
- Describe how General Data Protection Regulation (GDPR) of the European Union (EU), any other relevant national regulations, any institutional guidelines on ethics were followed.
- Include statements on potential conflict of interest.

Annex

Workshop Agenda

No need to translate it into English, if already well described above and in line with the WS Agenda Overview.

Relevant documentation materials from your Validation WS

Pictures, links to online boards, graphics, etc.