Transformative change from below? Linking biodiversity governance with the diversity of bottom-up action

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ABSTRACT

Individual actors and actor groups are vital catalysts of transformative change as they are able to initiate interventions that nurture and protect biodiversity. This paper analyses biodiversity-focused practices across the civil, market and public spheres to identify the modes of intervention that actors in Europe utilise when they seek to fight biodiversity loss as part of their every-day work or voluntary activism. Studying how actors locate and engage with biodiversity issues allowed us to develop a typology of intervention modes and to unravel interlinkages between biodiversity governance and bottom-up action in a new manner. The seven modes of intervention identified from the rich qualitative data demonstrate how bottom-up practices vary in terms of the tangible issues they seek to address. Practitioners and activists locate options for change in resource management practices, production and consumption systems, market conditions, and land-use, amongst others. The findings enact a Europe in which cohesion policies, land-use pressures and power lobbies controlling resource management generate resistance and spark innovation. The aspirations to affect policymaking and biodiversity governance vary from one mode to another. In some cases, governance is positioned as a target of bottom-up action. Governance can also be assigned an action-conditioning role or regarded as a critical part of the assemblage that can generate transformative change. The typology also grants visibility to potentially unrecognised modes and mediations along which transformative change is and might be further catalysed.

1. Introduction

A recent assessment of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) revealed that increasingly more substantial efforts to halt and reverse biodiversity loss are needed (IPBES et al., 2019). IPBES calls for *transformative change* that has the capacity to generate 'fundamental, system-wide reorganization across technological, economic and social factors, including paradigms, goals and values' (IPBES et al., 2018: XVIII). While promoting and steering transformative change, governance institutions ought to prioritise biodiversity more highly in their policy agendas (IPBES et al., 2019) and to ensure that governance practices generate conditions for biodiversity protection and advancement (Visseren-Hamakers et al., 2021).

Governance 'encompasses the relationships between government and society including the means through which private actors, markets, and interest-based networks influence policy decisions' (Chaffin et al., 2016: 401). The broad literature focusing specifically on *bottom-up governance* (Sohre and Schubert, 2022) emphasises the importance of the activities that shape societal development along, and in relation to, top-down government interventions. This literature discusses bottom-up governance under banners of collaborative environmental governance (e.g., Ansell and Gash, 2008; Innes and Booher, 2003); deliberative democracy (e.g., Dryzek et al., 2019; Smith, 2003); environmentality (Agrawal, 2005); collective action (Ostrom, 1990); social learning (e.g., de Kraker, 2017; Schultz et al., 2018) and social movements (e.g., Escobar, 1998), among others. Likewise, within the transformative change literature, Scoones et al. (2020) have advocated adaption of an *enabling approach*. While *structural approaches* focus on major historical shifts in the organisation of production and consumption, and *systemic approaches* consider system interactions and feedback that influence broad societal dynamics (Scoones et al., 2020), they both provide little space to analyse the advancement of transformative change 'on the ground' through caring, experimental or resisting action. Therefore, if the rationale is to learn from actors' experiences and to support their aims, structural and systemic approaches must be accompanied by an enabling approach that focuses on 'processes and capacities rather than just outcomes' (Scoones et al., 2020: 67; Caniglia et al., 2021).

In this paper we develop further the enabling approach to transformative change by drawing from environmental geography (Bulkeley, 2019), science and technology studies (Marres, 2007; 2015) and the multi-level perspective (Geels, 2011). The paper provides a methodology that serves examination of the various ways biodiversity concerns translate to tangible, 'actionable' issues. Asking where and how biodiversity issues are located, and how actors reach out to the issues, generates visibility to the varied material and practical engagements that characterise enabling action in Europe.

We use the developed approach to study the *modes of intervention* that actors in Europe utilise when they seek to fight biodiversity loss as part of their every-day work or voluntary activism. By 'modes of intervention' we refer to the practical orientations along which actors engage with nurturing and protecting biodiversity. Our key assumption is that concerns over biodiversity loss translate into attainable issues (Marres, 2007) following distinguishable patterns. For example, bottom-up actors across Europe may seek to influence issues related to land-use planning, viewing planning practices as both as a potential hindrance and as an opportunity for the actualisation of transformative change. However, biodiversity issues may be located and interventions mediated in some other ways as well. In addition to land-use plans, connectedness to biodiversity advancement can be mediated by business models, management experiments or conservation campaigns, for instance. A mode of intervention thus brings together practices and initiatives that localise biodiversity issues in similar ways and that invest in similar intervention-mediating elements.

The localisation of biodiversity action depends on what is understood to cause biodiversity loss and what arrangements, processes and phenomena need to be undermined and replaced to change undesirable trajectories. This is localisation in terms of a root problem. However, the root problem must be translated into an issue that is attainable through bottom-up action. Sometimes this may not require substantial effort. For example, in the context of planned road building or forest felling, biodiversity concerns can become highly pertinent and tangible. However, it is also possible that connectedness to biodiversity protection may call for the identification and innovation of mediating elements.

In this paper, the term 'bottom-up actor' refers to groups or individuals who initiate, organise and partake in activities that attempt to respond to specific situations and issues (Seyfang and Smith, 2007). This broad definition includes actors ranging from active citizens and citizen groups to policy entrepreneurs and company representatives. Adopting a multi-actor perspective (Avelino and Wittmayer, 2016) underlines that

enabling action cannot be placed into a specific institutional setting from the outset (Marres, 2015: 147–153). Intervening action unfolds in the messy realities in which people dwell and work. Sometimes, trailblazing bottom-up action emerges through individuals from within public and private organisations that as institutions have the power to make a difference, but which are largely resistant to fundamental alterations.

In what follows, we draw from diverse qualitative data across Europe to examine the following research questions:

1. What are the modes of intervention that actors adopt and utilise in their efforts to make biodiversity matter in new, and potentially transformative, ways?
2. How does governance configure as consequential for the different modes of intervention, and bottom-up activities consequential for development of governance?

By focussing on these questions, we seek to generate or further strengthen the positive links between enabling action and transformative governance. Moreover, developing the enabling approach (Scoones et al., 2020) as an analytical perspective, and doing so specifically in relation to biodiversity governance, allows us to enrich the understanding of how transformative change in the biodiversity nexus (IBPES, 2019) can be fostered. Interrogating the diversity of biodiversity action on the ground can help make such action consequential for biodiversity governance in potentially new ways. The ways actors interweave their practices with the ones of governing institutions can reveal the institutional and political shifts that actors deem consequential for the goals they seek to enhance. Enabling action can be a source of political pressure, capable of bringing issues on policy agendas and generating resistance towards harmful actions and developments. In addition, activities may qualify as 'niches' (Lai, 2023) or innovations (Seyfang and Smith, 2007; Smith et al., 2014) that can be actively advanced by policy decisions.

The paper is structured as follows. The next section presents our conceptual and methodological starting point in greater depth. Section 3 presents the data and the execution of the qualitative analyses. In Section 4, the different modes of intervention are presented along with the manifested entanglements between governance and bottom-up action. Section 5 discusses the findings and their implications, and Section 6 draws conclusions based on the analysis.

2. Navigating the diversity of enabling action

Protection and nurturing of biodiversity is often studied as an issue of importance to communities that resist threats to and the exploitation of ecosystems that support their ways of life. For instance, attention has been directed towards how social movements 'explicitly construct a political strategy for the defence of territory, culture, and identity linked to particular places and territories' (Escobar, 1998: 80). However, enabling action does not need be entirely place specific. While biodiversity flourishes or fails to do so in specific localities, in complexly networked societies, the whereabouts of biodiversity action are less clear. Enabling action may, for example, contribute to the development of alternative technologies and resource management practices, perhaps simultaneously seeking to safeguard actors' sovereignty in global production and consumption networks (Scoones et al., 2020).

Since biodiversity can be affected along diverse trajectories and interactions, it is justified to turn the question about the whereabouts of biodiversity action into its head (Bulkeley, 2019). This means that rather than tracing leverage points 'from above', we ask how bottom-up activities localise endeavours to fight biodiversity loss in terms of practices, processes or places. Answers to this question can be fruitfully used to differentiate the modes of intervention characterising bottom-up activities.

Focusing on the localisation of bottom-up action supports a shift from an analytical mode that operates in terms of pre-determined sites

or spatial scales of bottom-up action. In addition, localisation as an analytical approach serves sensitisation to practices of enabling action in a new way. Rather than asking how pregiven circumstances and policy goals are added meaning in practices or collective deliberations, localisation prompts to investigate how bottom-up action evolves along 'the assembly of heterogeneous elements' (Marres, 2015: 149). The perspective underlines that the circumstances in which individuals and groups operate can be assembled and turned influential for transformative change in perhaps unexpected ways. Bulkeley's (2019); see also Stripple and Bulkeley, (2019); Valve et al., (2022) assertions about climate action are therefore also highly relevant for biodiversity action: 'The task is not to understand how particular silver bullets can be implemented or policy levers can be pulled, but rather to open up the spaces of possibility for action and to generate new capacities for doing so' (Bulkeley, 2019: 5). This means that more attention must be directed towards the possibilities to make climate change—or biodiversity protection and nurturing—consequential in new ways. Tracing how bottom-up actors do so is one meaningful path forward.

The differentiation of modes of intervention allows us to examine how bottom-up actors and groups engage with biodiversity governance, how governance could support these interventions and what governance institutions might learn from the experiences of these bottom-up actors. The idea of bottom-up niches that can be shielded, intermediated and learned from originates from the Multi-Level-Perspective on sustainability transitions, which seeks to illustrate the dynamics of sociotechnical transitions. It does so by differentiating and exploring the interactions between three levels: niches, regimes and landscapes (Geels, 2011). In this framework, niches serve as experimental spaces that allow for ideas and approaches that challenge the regime (i.e., ideas that counter the practices, cultures and structures that are dominant in a system) to emerge. These experimental spaces allow for niches to be tested, refined and matured beyond the constraints of the regime, with the goal of challenging the (unsustainable) regime and creating a new, more sustainable, regime over time. Aside from identifying what social and practical innovations exist, the study of niches can also provide valuable insights into how path dependencies might be overcome and how governance can best support such efforts (Smith and Raven, 2012).

3. Materials and methods

3.1. Data collection

The data collection scanned the heterogeneity of biodiversity action in Europe. Rather than providing an exhaustive, representative analysis, our aim was to qualitatively develop a typology of intervention modes and to unravel interlinkages between biodiversity governance and bottom-up action. This was executed by collecting qualitative data through three distinct, but complementary processes: *a desk search of bottom-up initiatives, interviews, and focus groups.*

Geographically, the data collection covered all European regions, spanning from central Europe to the eastern, northern and southern parts of the continent. Thematically, the data collection leveraged the nexus concept to guide the selection of diverse and cross-sectoral biodiversity action across Europe. The nexus approach emphasises that protection and nurturing of biodiversity requires considering its relationship to a range of other environmental and societal concerns and sectors (Laspidou et al., 2020; Pascual et al., 2022; Pörtner et al., 2023). Biodiversity governance thus accounts for the potential positive or negative effects of climate, agricultural or forest policies and policy

measures, amongst others, on biodiversity—and vice versa, with the aim to minimise trade-offs and unintended consequences and maximise synergies and co-benefits.

We carried out the desk search in the languages spoken by the authors (Czech, Dutch, English, Greek, Italian, Finnish, Slovak) to collect *58 bottom-up initiatives* across Europe. Table 1 indicates the locations of the initiatives across different parts of Europe. We strove to collect a diversity of initiatives in terms of geographical coverage and nexus domains, whilst focusing on both emerging, bottom-up initiatives which are not well known and established cases nationally and internationally. The actors leading or participating in the initiatives could come from the public sector (e.g. national governments, governmental agencies, municipalities, public care institutions), the business sector (e.g. small and medium enterprises or large companies, service providers, private entrepreneurs) or the non-profit sector (e.g. citizens, citizen organisations, NGOs and foundations, charities, academia and expert organisations).

Twenty interviews with 22 interviewees (ten female, twelve male) were conducted with societal actors working to enhance biodiversity protection and its integration into nexus settings across Europe. For each country, we strove to include actors with different perspectives and experiences, comprising policy champions and civil servants, frontrunning enterprises, and active citizens. Policy champions were, for example, representatives in local or regional councils, party members, and provincial or national policymakers. Active citizens included representatives from NGOs, as well as national citizen movements and activists. Business actors included individuals seeking to make a difference withing or through private companies.

The actors selected were expected to discuss their experiences and efforts towards carving out space for new ways to make biodiversity matter. The focus was thus on the *practices of bottom-up biodiversity action.* The interview guide is available from the supplementary material. The interviews (duration between 1 and 1.5 h each) were recorded, transcribed and translated, if needed, in English.

The *focus groups* (lasting 2.5 h each) included 4–5 participants and were conducted in the national language using a common script. The focus groups brought national actors together to discuss specific themes related to *biodiversity governance*. In each focus group, we strove to include a diversity of participants keeping gender diversity in mind. The participants were selected based on their diverse experiences and expertise on the topics at hand, including people from the following sectors: finance and business; policy; NGOs and civil society; and research. These included, for example, representatives from national ministries and protected areas, NGOs, nature conservation associations, cooperatives, collectives, unions, companies, and business responsibility organizations. While the interviews spanned six European countries, the more resource intensive focus groups were organised in Czechia, Finland and Greece and the Netherlands. In the four countries in which both interviews and focus groups were conducted, interviewees did not overlap with focus groups participants, as we wanted to have a richness of data.

The scripts and themes of the focus groups are presented in the supplementary material. The focus group discussions were recorded and, whenever possible, the full discussions were transcribed, and in one case, a report of the discussion was synthesised.

In opposition to the desk search for initiatives, the interviews and focus groups were organised around specific nexus issues of particular relevance in the country, as shown in Table 2. In Belgium, the interviews focused on the nexus between biodiversity and health. In Czechia, the focus group explored the links between biodiversity and renewable

Table 1
The bottom-up initiatives identified from different parts of Europe.

	Eastern Europe	Northern Europe	Southern Europe	Central and Western Europe	EU-level	TOTAL
Number of initiatives	10 (Czechia, Slovakia)	10 (Finland, Sweden)	7 (Greece, Italy, Spain)	28 (Belgium, France, Germany, the Netherlands, UK)	3	58

Table 2

The interviews and focus groups arranged and their focus on nexus elements.

Data type	Belgium	Czechia	Finland	Greece	The Netherlands	United Kingdom	EU-level	TOTAL
Nexus element	Health	Energy	Climate	Water	Food	Transport	Transport	
Number of Interviews	3	3	3	3	2	3	3	20
Number of focus groups	-	1	1	1	1	-	-	4

energy investments. In Finland, the interviewees and focus groups participants were selected because of their work at the biodiversity-climate nexus. The focus group discussed continuous-growth silviculture in peatlands. Interviews in Greece focused on water, and the focus group specifically explored nature-based water management solutions in urban areas. In the Netherlands, the biodiversity-food nexus was central, and the focus group discussed intensive livestock industry close to valuable and threatened habitats. The interviews in the United Kingdom and the EU-level ones focused on biodiversity and transport.

3.2. Data analysis

The data were analysed qualitatively following two tracks:

1. Interviews and initiatives were analysed to identify modes of intervention (research question one).
2. Interviews and focus groups were analysed to explore the link between bottom-up action and governance (research question two).

When differentiating between the *modes of intervention* adopted by the bottom-up actors interviewed, we traced (i) how, and along what kinds of configurations of the biodiversity issue, actors position their efforts and (ii) what mediating elements are used to make bottom-up action consequential for efforts to fight biodiversity loss. In the first phase, we analysed the interviews one by one, writing memos that summarised the terms in which the interviewees described their practices in relation to a specific configuration of the biodiversity issue. This made the intervention-mediating elements visible. In the second phase, we analysed the memos in relation to each other, seeking to identify similarities between the localised biodiversity issues and the adopted intervention-mediating elements. We analysed the initiatives along a similar logic, focussing first on the implicit or explicit comprehensions of change-making routes and the opportunities the initiatives presented as central to them. This enabled us to categorise the initiatives based on the emerged typology.

The first phase of the analysis was carried out by the first and second authors, but the other contributors carefully reviewed the categorisations made. The typology presented in the next section should nonetheless be viewed as a continuum rather than a watertight categorisation. The rationale was to elaborate upon the diversity of action, as opposed to imposing stringent categories on the descriptions of action. Several 'border cases' were identifiable. Given the context-specific nature of the data, adding additional interviewees or initiatives might have changed our typology.

When analysing the interviews from the perspective of the *articulated enablers and barriers of biodiversity action*, we performed another round of content analysis. As this was a distributed effort, the analysis was carried out by the authors who had conducted the interviews. The findings were compiled into tables and aligned with the enablers and barriers identified by the first author vis-à-vis the different modes of intervention. Meanwhile, the focus groups were analysed only by the first author, with others contributing insights to the preliminary findings. The focus groups have been used in this paper as a backdrop to reflect upon the other findings. We analysed the focus groups first by identifying the enablers and barriers that were raised as critical for biodiversity governance and then by situating the findings in relation to those generated through the interviews.

4. Results

4.1. Modes of intervention

The analysis of the interviews and bottom-up initiatives introduced us to a diversity of actors and action contexts. The ways in which the interviewees and the initiatives pinpointed the sources of biodiversity loss and described their activities shows how diversely protecting and caring for ecosystems is made possible across Europe. The accounts point to potentially transformative changes that are aspired in resource management practices, production and consumption systems, market conditions and land use, amongst others. Altogether, seven different modes of intervention were equally distinguishable from the interviews and the initiatives, see Table 3.

The first mode of intervention, titled *Destabilising management regimes and production systems*, brings together practices and initiatives that position natural resource governance at the heart of the biodiversity issue that requires attention. According to the bottom-up actors, governance, and biodiversity governance as a part of it, allow such management of natural resources that has detrimental impacts on biodiversity. The actors and groups in this category thus situate themselves in a deeply political terrain. They contend that there is an urgent need for systemic transformation that must be advocated through resistance towards the policies and practices that maintain or strengthen the status quo. Resistance is mediated by drawing public attention to the problems caused by current policies, power imbalances and financial arrangements. According to an NGO representative from the Netherlands, articulation of interdependencies displays actors who tend to operate in the shadows:

> '*We aim to highlight the power of the agro-industry through a deliberately chosen narrative. We want to show what else exists in the food system beyond just the visible "farmer" and "consumer"*.' (NGO representative, the Netherlands)

Actors seeking to destabilise regimes and systems typically experiment alternative production patterns and influence policymaking through lobbying and the generation of public pressure. One apt example of the 'destabilising' mode of intervention is a successful policy initiative which led a Finnish municipality to break free from the dominant mode of forest management—clear cuttings—and to adopt continuous cover silviculture as the main forest management method in the municipality-owned forests. The interviewed Finnish actors intervened in a policy process in which this radical decision was made. This outcome will not only influence the protection and management of the approximately 400 forest hectares located in the municipality; it may also have wider repercussions, as affecting municipal policymaking was viewed as an example that others can follow and an outcome that can help add new policy alternatives to the national agenda.

In the second mode of intervention, actors *reappropriate or reallocate land and water* in specific regions and localities. Biodiversity issues are configured in terms of geographical localities and land use. Urban or rural spaces serve as potentials that need to be transformed into assets of biodiversity protection. In Rome, a collaborative map developed by a non-governmental organisation provides a bird's-eye view of the citizen-managed community gardens and public spaces re-appropriated by citizens. The intervention-mediating platform recognises the efforts of micro-initiatives and enables them to learn about and from each other. However, successful intervention may also require strict regulation. This

Table 3
Seven modes of intervention identified from the data.

No.	Mode of intervention	Targeted biodiversity issues and intervention-mediating elements
1	**Destabilising management regimes and production systems**	The cause of biodiversity loss is located within prevailing management regimes and in consumption and production systems that build on raw materials available with market prices that do not cover environmental and social costs. Change is advocated in policy processes, in courts and through publicity creation. Actors may also arrange conservation campaigns and invest in alternative production practices to catalyse change and mediate intervention.
2	**Reappropriating or reallocating land and water**	Action is taken to reappropriate land and water for protection or for uses that support biodiversity. In this mode, change is mediated by geographical space. The focus is on altering the intended use of a territory by occupying or negotiating the utilisation of physical spaces, public or private.
3	**Initiating and orchestrating collective action**	The orchestration of collective action is used to mediate intervention and to trigger changes in specific localities. The focus can be on the promotion of ecosystem restoration, biodiversity management or alterations in cemented practices. Successful interventions require that individuals, firms and organisations commit to the joint effort and do their share. Project and platform organisations often provide individuals with means to become engaged.
4	**Capturing economic value from biodiversity and biodiversity protection**	The diversification of and care for ecosystems can be placed at the centre of business operations. This occurs when a company invests in the commodification of products and services that generate value from biodiversity- or nature-inclusive practices. The new commodities and business models mediate interventions. The actors seek to reorganise markets. The creation of economic value is used to make biodiversity matter.
5	**Integrating biodiversity with business operations and infrastructure development**	For many public and private organisations, biodiversity matters as an environmental responsibility issue. Action is contrasted to ignorant and non-innovative business-as-usual practices. However, the integration of biodiversity concerns does not affect the core aims and functions of an organisation. Specific biodiversity schemes mediate intervention. They can provide means to improve performance or to protect the ecosystem services critical for business operations and infrastructure maintenance.
6	**Making biodiversity matter for local and regional development and wellbeing**	The need to make biodiversity concerns consequential for regional development, or even an asset of regional development, provides an entry point to interventions. Projects, regional planning and

Table 3 (*continued*)

No.	Mode of intervention	Targeted biodiversity issues and intervention-mediating elements
		advocated changes in funding criteria mediate intervention. In addition, ecosystem restoration and nature-based solutions can be used as a specific means by which the regions could be provided additional boosts.
7	**Environmental education and awareness-raising**	Actors resist biodiversity-related ignorance and generate publicity for sustainable solutions through education and publicity-creation. In addition, environmental education activities can be used to showcase how, through small adjustments in every-day routines and working environments, biodiversity can be nurtured. Mediating elements include exhibitions, social media and curricula.

proved to be the case when a new marine protection area was established in Greece:

> '*For* [local] *fishermen, it was to their benefit since we had put in force a permit system. Only fishermen with issued permits could enter* [the area].' (Policy entrepreneur, Greece)

Potentially transformative change is also enabled through the re-organisation of social-material relations in particular localities. The third mode, namely '*Initiating and orchestrating collective action*', unites projects and schemes that aim to create new networks and tools to support individual citizens and resource users to address a local biodiversity issue. Money can also play a specific mediating role in reorganisation attempts. For example, a water management project adopted in the UK offers farmers payment for water storage on their land. This arrangement allows for the restoration of natural sponges, providing buffer capacity against floods and droughts and improving aquatic biodiversity. Meanwhile, in Belgian city, a NGO promotes citizens' own ideas about citywide collective action. The work tests the engaging powers of the ideas:

> '*Our way of working is more like… start with a little project, see how it works… We always have to check: is this what people are waiting for?*'. (NGO representative, Belgium)

In the fourth mode, the diversification of ecosystems can be placed at the centre of business operations. This is the case when '*Capturing economic value from biodiversity and biodiversity protection*' is the driving force. This occurs when a company invests in the sustainable utilisation of life forms that are conventionally viewed as expendable. The investments, and the commodities that ensue, mediate intervention as they provide new means of transforming efforts to counteract biodiversity loss into a source of economic value. Alternatives are simultaneously generated for prevailing practices and business models. For example, a membership-based company in France provides technical advice and training for large-scale farmers to transition towards simplified and regenerative agricultural principles while improving profit margins. Similarly, a private company in Finland seeks to make profit by serving forest owners who wish to manage their forests in a biodiversity-sensitive way:

> '*Now that the forest owner has the freedom to decide how s/he wants to manage and grow the forest, there is also a service for that need* [provided by us]*… There is a large group* [of forest owners] *that also wants financial return, but* [for which] *that* [the return] *is not necessarily the number one thing. They also want to prioritise biodiversity, landscape and other values.*' (Company representative, Finland)

In companies, and in healthcare and infrastructure maintenance organisations, amongst others, biodiversity is often made to matter along with separate biodiversity schemes. The schemes mediate intervention that aims towards '*Integrating biodiversity to business operations and infrastructure development*'. In line with such a rationale, a public body in the UK has adopted a strategy that emphasises care for infrastructure as a potentially life-generative activity, apt to reduce biodiversity loss. Biodiversity loss is viewed as an issue that must be considered innovatively in all actions. This may result in evolution of new mediating elements and capacities. For example, it may turn out that a flower close to a railway line 'is not just a flower—it is a biodiverse flower' (Knudsen et al., 2022: 727).

This mode of intervention gains virtue in contrast to routine, unsustainable and inattentive practices. Such mainstreaming of biodiversity is for the public body, as for others making use of this interventive mode, a complementary task that does not affect the end products: '*it* [the biodiversity-enhancing choices and principles] *does not need to affect the outputs or the primary aim of the organisation*' (Policy entrepreneur, UK). Meanwhile, governing instruments such as Biodiversity Net Gain was reported to be '*really a key*' (Company employee, UK).

The need to make biodiversity concerns consequential for regional development, or even an asset of regional development, characterises the sixth mode of intervention, titled '*Making biodiversity matter for local and regional development and wellbeing*'. Since the prosperity of European regions varies, both nation states and the European Union provide financial support for regional development projects and programmes. Bottom-up actors seek to make the most of this finance while fighting the short-sighted and non-innovative economic exploitation of less-wealthy regions. A Czech initiative therefore creates and maintains biotopes in one of the poorest regions of the country by employing participants in the establishment of low-maintenance production ecosystems. In Greece, recession hitting a region was mobilised as an impetus to diversify and transform the economy:

'*Before the crisis we had developed a touristic model that had a monoculture towards the sea tourism. Only in the summer we had hordes of visitors coming from the Balkans, Russia and some from Europe that wanted to have their summer swims in the sea. What we want now is a more sustainable model, a model that will include both the circular economy and local products, but mainly that is not limited to summer tourism.*' (Policy entrepreneur, Greece)

Finally, it is possible to differentiate a seventh mode of intervention, namely '*Environmental education and awareness-raising*', that is predicated, for example, on mediating powers of social media, exhibitions and curricula:

'*We organize trainings, seminars and events.* [] *The educational programs are not only for children. There are educational programmes for adults. For example, there is a programme in the council called "protect my planet from the office", where we teach employees to make small adaptation adjustments*'. (NGO representative, Greece)

4.2. Entanglements between governance and bottom-up action

The characterisation of the different modes of intervention shows that bottom-up actors strive to reach public policymaking in different ways and intensities. Policies and governance institutions are not always part of the specific biodiversity issues actors seek to confront and affect. However, this does not mean that governance frameworks would not significantly condition the ways in which the enabling of potentially transformative change occurs and what enabling can achieve. To explore these interlinkages, we asked our interviewees to describe the barriers and enablers shaping their capacities to act and achieve their goals. This provided us with the means to analyse how the circumstances of change-making differ between interventive modes and to trace how the interviewees describe the roles of public policies and governance

arrangements for their work. The findings are summarised in Table 4.

The differentiation of the barriers and enablers from one mode to another further underscores the multiplicity of the realities and orientations in terms of which biodiversity is made to matter across Europe. Some barriers and enablers nonetheless recur in Table 3. Policies, regulations and funding schemes are often portrayed as enablers of the form of change the actors seek to advocate. Facilitating transformative change is commonly, albeit not always, connected to, or even predicated upon, governance. A key problem of governance often relates to its insufficiency. Regulators and regulations do not do their share, leaving a lot to the efforts of individual policy entrepreneurs, forerunning companies and citizen movements. The list of identified shortages includes transformative policies in general, strict funding criteria for regional development projects and managerial tools to support integration of biodiversity concerns to practices and decision-making.

The possibilities of bottom-up action to trigger change are often believed to depend on the possibilities to undermine cemented communities of decision-making and practice. This applies to '*Regime destabilisation*', '*Reappropriation of land and water*' and '*Regional development*' modes of intervention. Alternatively, people merely need to take matters into their own hands, as the '*Collective action*' mode indicates. In both cases, the enrolment, education and empowerment of citizens and the generation of collective force are envisioned to create options for change. However, the '*Integration of biodiversity*' mode is sometimes characterised by a notable technocratic twist. Transformative change is then argued to necessitate data, assessments and various types of calculative tools.

The barriers and enablers of transformative change were also discussed in the four focus groups arranged in different countries. A summary of the focus groups can be found in the supplementary material (Appendix 3). The key finding is that while the groups predominantly addressed governance issues, they generated an understanding of transformative change that is, at the same time, both broader and narrower than the overall view provided by Table 4. In other words, the focus on governance brought forth new features as critical for the making of transformative change but also left some barriers and enablers raised in the interviews unaddressed.

In the focus groups, transformative change was discussed in line with the '*Regime destabilisation*' and '*Integrating biodiversity*' modes. This means that the barriers and enablers identified as critical in the focus groups included policy instruments and their implementation, as well as governmental technologies such as valuation and impact assessment tools. However, the grassroots activists seeking to undermine current management regimes were more critical than the assemblages of policy officers, scientists and interest organisations and NGO representatives, who sought to keep the discussion consensual in the focus groups.

The circumstances in which policies are prepared and implemented gained, unsurprisingly, substantial attention in the focus groups. The institutional settings provide a shared action context but also configure as problematic issues. Focusing on biodiversity governance sparked discussions about institutional path dependencies and about the consequences of unambitious, under-resourced and even corrupted units of public administration that should guide the implementation of EU policies. Meanwhile, reasoning along the '*Reappropriation of land and water*', '*Collective action*', '*Value creation*' and '*Regional development*' modes gained less attention in the limited timeframe of the focus groups. The regulations and tools needed to make resource management practices and land-use planning more 'nature-inclusive' were commonly discussed in the focus groups, but the barriers caused by unclear bureaucratic procedures, political wheeling and dealing encountered in political processes and the time-consuming negotiations with local actors, for example, remained outside the enacted realities of biodiversity governance.

Table 4

The modes of intervention (1 –7) with examples and characterisations of mode-specific barriers and enablers.

No.	Mode of intervention	Example	Barriers	Enablers
1	**Destabilisation of management regimes and production systems**	A Dutch NGO works to create publicity regarding the harmful financial arrangements of agroindustry and to build up agro-ecological production by bypassing conventional market structures.	Food and timber markets disincentivise nature-inclusive production and resource management. Production occurs in terms of scattered units that have minimal leeway and where livelihoods are at stake. Regulators may be unwilling to resist the power lobbies.	Environmental goals and regulations have the potential to create new markets and incentives. Policy communities may be forced to open up. Networks of activists or experimenters generate mass power and point to options for change.
2	**Re-appropriating or reallocating land and water**	In Greece, actors campaigned for the establishment of a national park in a tourism-intensive region. This called for the enrolment of financial resources and the engagement of local entrepreneurs and fishermen.	Land and water bodies are tangible resources, the reappropriation of which tends to require money, mapping tools and biodiversity expertise. Bureaucracy and established business practices can be significant obstacles.	Possibilities of the land-use change to support an area's livelihood opportunities are an asset (see modes 4 and 6). Negotiation skills, networks and access to finance can be important assets. Collective action (mode 3) can also facilitate change.
3	**Initiating and orchestrating collective action**	In a Belgian city, a platform organisation provides citizens the means to advance their ideas about biodiversity and environmental protection.	Acting as an organiser of collective action necessitates resources. If participants are compensated for their efforts, resource needs can be substantial.	Examples from other locations can inspire the generation of initiatives. Collective action can be self-reinforcing, but this may require refraining from radical forms of action.
4	**Capturing economic value from biodiversity and biodiversity protection**	In Finland, some forest management companies provide services only related to continuous cover forestry. In some conditions, a shift from periodic silviculture to continuous cover forestry is necessary for the sustenance	The companies operate in the shadows of the mainstream operators who have 'green' campaigns of their own. Potential clients may favour well-known but less sustainable solutions. Subsidies and technologies support business-as-usual practices.	Changes in policies and regulations can support the formation of new markets and revenue options. For example, economic incentives can be changed to promote continuous cover forestry and hence also to increase demand for

Table 4 (*continued*)

No.	Mode of intervention	Example	Barriers	Enablers
		of carbon sinks and biodiversity.		related services.
5	**Integrating biodiversity to business operations and infrastructure development**	A soft drinks producer from Czechia works to integrate ecosystem restoration and renewable energy projects within its water supply and management activities.	The integration of biodiversity is hampered by member states' resistance to the biodiversity strategy and the ambiguity of biodiversity as a concept. Metrics and measurement standards are lacking.	EU policies and green deals can establish common pressures for integration. Increasing awareness is an enabler, and education regarding biodiversity must therefore be strengthened.
6	**Making biodiversity matter for local and regional development and wellbeing**	A Greek local councillor works to transform a region impacted by economic crises into a green region. A new economic model is to be created to replace the broken one. Funding is targeted to infrastructure renewal (e.g. water supply, drainage), and new tourism concepts are being developed.	Bureaucracy; regions' dependence on investments; tensions between energy provision and biodiversity; unambitious development projects and poor management. 'Green' projects can operate as greenwashing if biodiversity is being sacrificed in other fronts of economic development.	The mobilisation of scientific expertise and local communities and learning from other regions can help to identify sustainable pathways forward. Recovery funding and other support schemes are assets. There is also rich biodiversity to build on and which requires care.
7	**Environmental education and awareness-raising**	A Europewide NGO organises educational events to support change in the use of peat and peatlands. The youth-led organisation aims to restore peatlands and reduce peat extraction.	The implementation of education initiatives calls for resources that can be scarce. Bureaucracy can be a hindrance as well. A lack of policy continuity can hinder the consistent application of educational programmes.	Experiential learning connects people with biodiversity issues. Embedding sustainability in educational programs is beneficial.

5. Discussion

In this paper, we have developed and applied means by which the diversity of bottom-up, transformation-enabling activities can be analysed and structured. We have argued that bottom-up action may be found in settings that are not commonly identified as a 'lower level' compared to the 'hierarchical elite' (Sohre and Schubert, 2022: 3) operating top-down. Therefore, we have gone beyond specific sites, the domestic sphere and environmental movements to ask how actors and groups operating in diverse institutional settings localise and reach out to biodiversity issues. Instead of focusing on the empowerment and 'cultivation of environmental *subjects*' (Agrawal, 2005: 180, our

emphasis; Dryzek et al., 2019; Scoones et al., 2020), our primary interest has been on the translation of biodiversity concerns into *objects* of potentially transformation-enabling action (c.f. Marres and Lezaun, 2011). This approach allowed us to provide a glimpse to the diverse modes of intervention through which enabling, biodiversity-focussing action unfolds in Europe.

We identified altogether seven modes of intervention adopted by European bottom-up actors. Despite the heterogeneity of the European contexts in which individuals and groups act, there are similarities in how biodiversity is rendered an attainable issue that can made to matter in ways that extend beyond business as usual. In this sense, our findings enact a Europe in which regional cohesion policies, land-use pressures and power lobbies controlling resource management practices generate resistance and spark innovation across public, private and civic domains. Location of biodiversity issues varies from maintenance of public spaces, resource management and land-use practices to networks figuring financial arrangements, oligopolist market structures and policy lock-ins. Likewise, the efforts to foster 'the value of nature's contributions to people through thriving with nature' (Bulkeley et al., 2022: 296; Xie and Bulkeley, 2020) are notable.

Bottom-up actors often seek to address the regulatory and economic instruments of public governance. When the aim is to transform biodiversity concerns consequential, for example, for regional development and urban planning, policy instruments also mediate intervention. The connection between bottom-up action and governance is, in these cases, intimate. Likewise, the attempts to destabilise management regimes can be regarded as integral to biodiversity governance.

Enabling of potentially transformative change occurs also commonly via intermediating (Hargreaves et al., 2013; Kivimaa et al., 2019) or bridging (Berdej and Armitage, 2016; Schultz et al., 2018) activities. The aim is then to empower and bring together actors and ecosystems. In addition, the experiences of bottom-up actors indicate that intermediation, as a governance instrument, could contribute to transformative efforts. As bureaucracy and unclear regulations were repeatedly identified as barriers, and learning from others was highlighted as an enabler of bottom-up action, it appears that public investments in intermediating services can be worth considering. This is particularly the case regarding regional development initiatives and programmes. In this field, the amount of public spending is high. An independent body tailored to supporting and bringing together transformation-seeking initiatives could operate as a useful niche intermediary (Kivimaa et al., 2019) that helps to make public assets supportive of *governance for transformation* (Bulkeley et al., 2022; Patterson et al., 2017).

The mapping of the barriers and enablers characterising the different modes of intervention indicates that enabling action is often conditioned by resources allocated, and workload generated, by governing institutions. The workload is due to the underperformance of the institutions while resource dependency often points to the projectification (Munck af Rosenschöld and Wolf, 2017) of enabling action. The barriers raised as consequential also suggest that governance arrangements can fail to provide space for transformative inputs (Hebinck et al., 2021; Smith and Stirling, 2017).

The modes of intervention identified vary regarding the extent to which they question, challenge or confront policies, power blocks and practices. Some modes of intervention, such as the '*Integrating biodiversity*' and the '*Collective action*' modes, are oriented towards additionality and peaceful coexistence with pre-existing courses of action. These modes of intervention bring together practices that tend to follow what Smith and Raven (2012) call a 'fit and conform' strategy of niche empowerment. When this strategy is followed, biodiversity is made to matter for socio-technical development in a way that does not require substantial reforms in prevailing institutions, infrastructures or market logics. Meanwhile, the '*Destabilisation*' mode, in particular, mobilises a 'stretch and conform' strategy (Smith and Raven, 2012). The targeted biodiversity issue is configured in terms of unsustainable incumbent systems that must be replaced by alternative regimes and operational

logics. However, as Smith and Raven (2012) conclude, the 'fit and conform' and 'stretch and confirm' strategies can be expected to intertwine in practice. An intervention may be disruptive in some respects but 'regime-maintaining' in others (Lazarevic and Valve, 2020). Moreover, interventions that appear incremental and 'fitting' may 'stretch' the circumstances in which the actors operate. Even small changes may call for incredible courage and persistence: 'Niche agency results from sense-making advocates with uneven access to resources who try to influence powerful actors in different institutional positions' (Smith and Raven, 2012: 1031).

An instrumental approach to bottom-up action has also been criticised (Schmid and Taylor Aiken, 2023). The risk is that enabling activities and their modes of intervention come to be understood as apolitical and in some sense 'organic' as they emerge from conditions of possibility generated 'from below' (Avelino and Wittmayer, 2016). However, bridging and intermediating activities, for example, cannot be treated as merely technical efforts (Berdej and Armitage, 2016; Schultz et al., 2018).

The issues raised by the collected initiatives and the bottom-up actors in the interviews surfaced in varying intensities in the focus groups where biodiversity governance was discussed. Although the reasons for such a selective agenda-formation can be diverse, the finding indicates that without the analysis of the initiatives and interviews, we would have been able to provide only a rather managerial and generic account of what the making of transformative change implies. This further underlines the value of the enabling or complementary approach (Scoones et al., 2020) as means that can unravel how spaces of possibility for the making of transformative change (Bulkeley, 2019) can emerge. Analysis of bottom-up action can thus serve governance and policymaking as a reflexive interface that guides one to ask how nature, and care for biodiversity, can be transformed into objects of intervention (Bulkeley et al., 2022; Huff and Brock, 2023; Valve and Valkama, 2024).

6. Conclusions

This paper has drawn from, and further developed, the enabling approach to transformative change to analyse the modes of intervention that bottom-up actors utilise when they seek to make biodiversity matter in potentially transformative ways. The methodology developed and applied in the paper invites analysts to trace how biodiversity as a global sustainability challenge, but also as a localisation demanding matter, becomes configured as issues that can be addressed through specific mediating elements, such as regulatory proposals, restoration initiatives – or flowers in a public park.

The application of the analytical framework to the rich data collected across Europe resulted in the identification of seven modes of intervention. These modes indicate that bottom-up activities focusing on the protecting and nurturing of biodiversity follow similar, distinguishable logics across Europe. However, the modes identifiable from our data differ from each other in terms of their aspirations to affect policy decisions or foundations of biodiversity governance. In some cases, governance is positioned as part of the biodiversity issue actors seek to target. Governance can also be granted an action-conditioning role or regarded as a critical part of the assemblage that can generate transformative change.

The typology also grants visibility to potentially unrecognised modes and mediations along which transformative change is and might be further catalysed. The bottom-up actors have invested innovatively both in the empowerment of fellow humans, as well as in the contributions that nature has to offer to support a sustainability transformation. The sorting of the modes of intervention thus helps policymakers, including the bottom-up actors themselves, to learn from, become inspired and engage with innovations and niches. It can also make explicit the critical roles that some grassroots actors have adopted, as the governance bodies have not done their share to foster transformative change. In this sense, the mobilisation of the enabling approach to the analysis of

transformative change can help not only to reflect the issues and interventions dominating biodiversity governance but also to point to the incumbent forces, marginalised issues and disconnections with which individuals and groups struggle when seeking to make biodiversity matter.

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CRediT authorship contribution statement

Helena Valve: Writing – original draft, Methodology, Investigation, Data curation, Conceptualization. **Dalia D'Amato:** Writing – original draft, Investigation, Data curation. **Aniek Hebinck:** Writing – original draft, Methodology, Conceptualization. **Anita Lazurko:** Writing – original draft, Investigation, Conceptualization. **Mara de Pater:** Writing – original draft, Investigation. **Romana Jungwirth Březovská:** Writing – original draft, Investigation. **Heli Saarikoski:** Writing – original draft, Investigation. **Chrysi Laspidou:** Writing – original draft, Investigation. **Hans Keune:** Investigation. **Konstantinos Ziliaskopoulos:** Investigation. **Zuzana Harmáčková:** Investigation.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.envsci.2025.104000.

Data availability

The data that has been used is confidential.

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