PBL Netherlands Environmental Assessment Agency

EXPLORING NATURE-POSITIVE PATHWAYS

A CONTRIBUTION TO THE IMPLEMENTATION OF THE CBD POST-2020 GLOBAL BIODIVERSITY FRAMEWORK

SUMMARY & MAIN FINDINGS

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Exploring nature-positive pathways. A contribution to the implementation of the CBD Post-2020 Global Biodiversity Framework – Summary & Main Findings

The Hague, 2022
PBL publication number: 4439

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Acknowledgements
Our thanks go to our external reviewers, including Professor Graeme Auld (Carleton University); Jelle Behagel, PhD (Wageningen University & Research); Professor Harriet Bulkeley (Durham University and Utrecht University); Ingrid Coetzee, PhD (ICLEI); Verina Ingram, PhD (Wageningen University & Research); Martin Lok (Capitals Coalitation); Robert McDonald, PhD (The Nature Conservancy); Suneetha Subramanian, PhD (United Nations University).

Furthermore, we thank, Rob Alkemade, Like Bijlsma, Daan Boezeman, Machteld Schoolenberg, Elke Stehfest, Clara Veerkamp (all at PBL) for their input, and lastly we thank Willem-Jan van Zeist, Jelle Hilbers, Jan Janse, Elke Stehfest, Michel Bakkenes, Andrzej Tabeau, Aafke Schipper and Rob Alkemade for their work on the scenario analysis included in this report.

Visualisations
Beeldredactie PBL

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On this report
This printed report contains the Main Findings en is part of the bigger report Exploring Nature-Positive Pathways. The full report is available on pbl.nl/en.

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Foreword

This report addresses one of the major challenges humanity is facing: taking responsibility for addressing the root causes of biodiversity loss and restoring nature to fulfil the ambition to make humans live in harmony with nature. It was written in the run-up to the 15th Conference of the Parties to the UN Convention on Biological Diversity (CBD). COP-15 was originally scheduled to be held in Kunming (China) in 2020, but was postponed due to the COVID pandemic and will now be held in December 2022, in Montreal (Canada), under the presidency of China. This conference will take place at a time when the intractable linkages between climate change and biodiversity loss are becoming increasingly visible and we are in need of solutions to both problems.

This UN conference will set the agenda for biodiversity policies for the coming decade. It aims to provide a transformative framework for biodiversity, including a new set of targets for the coming decade to achieve just transitions towards nature-positive societies. The success of a new global framework on biodiversity governance relies on combining 'whole-of-government' and 'whole-of-society' approaches to achieve nature-positive development pathways and taking a holistic approach towards the multiple values of nature. The challenge for governments in implementing this framework will be to build productive linkages between these whole-of-government and whole-of-society approaches in order to deepen and accelerate a just transition towards nature-inclusive societies. The worldwide efforts on biodiversity that are made by citizens, indigenous and local communities, NGOs, business and finance provide a very welcome signal and create important opportunities for realising the transformative changes that are needed.

This report analyses two alternative pathways to achieve ambitious long-term biodiversity goals, reflecting the multiple values of nature, while achieving the objective of staying well-below the 2 °C global warming target (Paris Agreement) and ensuring food security (Sustainable Development Goal 2). This analysis shows the necessity of combining strong conservation policies with those on climate mitigation and reforming food and energy systems, if we are to 'bend the curve for biodiversity' and restore nature. The question that is addressed in this report, but is often left untouched in scenario analyses, is how to achieve these transformative changes and what governments can do to make this happen.

This report presents transformative governance arrangements that will contribute towards achieving nature-positive development pathways that are highly relevant for a broad approach towards nature policy in various contexts, such as rural landscapes, supply chains and cities. The challenge for government authorities will be to build on the energy that is there in society, in order to enable these transitions and act on developing new, nature-positive and climate-neutral pathways and abandoning those that are unsustainable.

Addressing the root causes of biodiversity loss and climate change requires a systemic understanding of the transformative changes, which also needs to be combined with addressing the structural dimensions of changing underlying values in society, as well as of production and consumption systems. Only then will actions in the coming decade result in a step towards achieving the CBD 2050 vision of living in harmony with nature.

I sincerely hope that this report will contribute to the implementation of CBD's post-2020 global framework on biodiversity governance and inspire the exploration of nature-positive development pathways!

André van Lammeren, PhD

Acting Director-General
PBL Netherlands Environmental Assessment Agency

Summary

Given the lack of progress in achieving international targets on biodiversity, a fundamental change in biodiversity policy worldwide is crucial.
Purely incremental changes in nature governance cannot reverse the trend of biodiversity loss. Transformative change of the socio-economic root causes that drive biodiversity loss is required, not only to halt the loss of biodiversity but also to restore nature worldwide. In addition to large-scale protection and restoration efforts, reorganisation of production and consumption patterns will also be essential.

To bend the curve of biodiversity loss, conservation efforts need to be complemented by a broader set of sustainability measures, especially strong ones on climate change mitigation in energy and food systems, including dietary changes away from meat and dairy.
A quantitative analysis of solution-oriented scenarios shows that ambitious conservation efforts alone will not be enough to bend the curve of biodiversity loss, and might even increase trade-offs between conservation and other sustainability goals, such as food security. To achieve biodiversity, climate and food security goals together, ambitious conservation strategies need to be complemented by broader sustainability measures. These measures include climate mitigation in line with the 1.5 °C objective of the UNFCCC, reduction in meat and dairy consumption and food waste, and making agricultural production more sustainable. Consumption changes, in particular, are key to avoid trade-offs in combined biodiversity, climate and food security policy agendas.

Building on the increasing nature-related efforts by non-state and state actors on sub-national levels provides opportunities for realising transformative change.
Over the past years, there has been an increase in the contributions from non-state and state actors on regional and local levels (e.g. cities, regions, companies, NGOs, and indigenous peoples) to conserve and restore nature. The CBD calls this a 'whole-of-society' approach to change, which is also recognised in its post-2020 Global Biodiversity Framework. The CBD could build on this 'groundswell of action' to strengthen future implementation, as these initiatives provide the seeds of transformative change for biodiversity. However, there are barriers to scaling up these bottom-up efforts, such as a lack of both recognition and adequate governmental policies to support these initiatives. The question, then, is how non-state actors and state-actors on local and regional levels could be more effectively supported by their national government and international institutions to achieve the transformative changes that are needed.

Multiple nature-positive pathways are possible in rural landscapes, supply chains and cities.
The objective of a nature-positive future is defined as reversing nature loss to achieve a net positive improvement by 2030 (i.e. resulting in more biodiversity and nature in 2030 than we have today), with full recovery by 2050 (requiring large-scale restoration of nature). This report explores what nature-positive pathways could mean in three specific configurations of societal actors and nature: rural landscapes, supply chains, and cities. The configurations are networks where non-state actors and state actors on sub-national level and national governments are considered together with different types of nature (e.g. agricultural lands, wild areas, urban parks). The analysis shows that options for nature-positive pathways are available to the non-state and sub-national state actors in these configurations. This points to the possibilities for national governments to develop policy strategies aimed at actors in these specific contexts to enable transformative change.

Achieving ambitious nature goals must happen within a framework of multiple values of nature in which attention to justice is essential.
To support a whole-of-society approach, government authorities should recognise and support the multiple ways that stakeholders value, depend on and integrate nature in their operations and activities. Recognising and rewarding multiple values of nature would provide national governments with an opportunity to strengthen non-state actors and state actors on sub-national levels in their commitment to change. Government authorities need to deal with power imbalances between stakeholders and economic sectors to ensure a just transformative change and avoid adding to socio-environmental injustices, marginalisation and harm to certain groups within society.

Rural landscapes are key in any transformation towards a nature-positive future as they contain key biodiversity hotspots, host food production systems and accommodate other important human activities.
Rural landscapes are contested areas where multiple actors compete to shape and govern them. Currently, sectoral approaches still dominate the governance of rural areas, which are characterised by the co-existence of conservation, agriculture, tourism, forestry and other sectors. These approaches often fail to integrate the various sectors and ecosystems within rural landscapes. For transformative change, rural landscape governance needs to move away from sectoral approaches and adopt integrated landscape approaches where the different sectors, stakeholders, and both managed and natural ecosystems come together to deal with differing interests, prevent trade-offs and optimise synergies towards nature-positive approaches and overcome siloed sectoral ones. Landscape approaches offer opportunities for enabling a transition away from the still common top-down approaches to rural landscape governance and supporting bottom-up initiatives and decision-making. This can empower local actors and build on the ways they value, depend on and use nature.

Considering the strategic role that rural landscapes play in nature-positive transformations, it will be necessary to address power imbalances between multiple actors. Landscape approaches must result in a change in the distribution of material resources across all stakeholders. Historically marginalised and oppressed groups, such as indigenous peoples and local communities, women and youths, should be included and empowered to achieve

a just transition. National governments can support integrated landscape approaches in rural areas via a set of policy tools, ranging from decentralisation of decision-making to the creation of local partnerships and platforms for knowledge-sharing and collaborations, to financial aid and the deployment of local investment tools. Finally, they could organise the process of inclusive land-use planning, secure land tenure and define environmental regulations to facilitate and empower local actors in their negotiations.

Supply-chain action is necessary for business and finance to contribute to the objective of nature-positive approaches and restructure production and consumption patterns.
To reach transformative change, economy-wide transitions are needed for the consumption, processing and production parts of supply chains. This, in turn, calls for collective action by business and finance, and for combining interventions at various steps in the supply chains of food, energy and materials. The focus on supply chains addresses actors with both direct and indirect links to biodiversity loss. There is a large potential for business and finance to contribute to nature-positive approaches. Their actions can be guided by the conservation hierarchy that is promoted in various business-oriented initiatives. Still, incremental changes in existing business models of individual companies will not be enough to reach the objective of transformative change for a nature-positive future. Actors from the financial sector have an important role to play in this by managing the risks of environmental degradation caused by companies within their portfolios and by supporting investment in nature-positive innovations.

When choosing policy instruments to activate companies that are — directly or indirectly — responsible for biodiversity loss, national governments should take motivational factors of companies with different sustainability ambitions into account. Pro-active companies that shape the early phase of innovation can be supported by facilitating and enabling policies, while passive companies can be activated by regulation in the later phases of transition when innovations have to be mainstreamed. This requires a coordinated approach to actors, in both the supply chains and the production landscape in which they operate.

The cross-border character of many supply chains calls for an international governance approach, as there are different jurisdictions involved. Special attention is needed for a fair distribution of the costs and benefits of transitions in cross-border settings. Insights are needed into how the various instruments of non-state actors and state actors on sub-national levels can be combined in producer and consumer countries. Such insights can for instance be obtained by closely following the effects of current policy developments to establish deforestation-free supply chains for agro-commodities.

Cities are crucial arenas for realising a nature-positive future; city dynamics affect direct and indirect drivers of biodiversity loss, both within and beyond their boundaries.
Far too often, practitioners are focusing on how urban growth and land conversion are threatening biodiversity, which tends to neglect the multiple ways in which cities address both direct and indirect drivers of biodiversity loss. Some urban initiatives contribute directly to conserving and restoring biodiversity within cities boundaries, while others are

doing so more indirectly, such as by addressing climate mitigation or by showing people how to use land differently. Yet, despite the increase in urban nature in cities, there are certain barriers to urban greening (e.g. limited private sector investment) that can only be overcome by targeting the underlying structural conditions (e.g. lack of public mandate). Therefore, transformative change in urban development towards nature will require a fundamental shift in the 'urban infrastructure regime' and engagement in the practices of multiple actors across the regulatory, urban development and financial domains — thus, leading to fundamental changes to the ways cities develop and function.

Combinations of various smaller actions are needed, such as establishing partnerships and community-based actions, to create transformative pathways. Policymakers could create their own specific pathway by identifying pivotal stepping stones, based on their particular policy context, to key actions that would enhance urban nature. To this end, a range of regulatory, financial and 'soft' governing mechanisms are available to national and local policymakers, such as the implementation of certain rules, financial rewards, knowledge-sharing and voluntary agreements. In this respect, it is also essential to acknowledge the unequal distribution of urban nature within cities and as well as risk of these inequalities being exacerbated by new interventions to achieve a nature-positive future. Moving forward requires combining stepping stones for various stakeholder groups, while addressing the inequalities that are brought about by pursuing nature-positive futures, creating cities where people and nature can thrive together.

National governments have an important role in supporting and enabling ambitious whole-of-society approaches to realise transformative change for biodiversity.

Many societal actors around the world are already mobilising and taking action for biodiversity, showing the first stages of the transformative changes needed ('seeds of change'). This report suggests that this 'groundswell of action' requires a series of government interventions to accelerate and scale up those efforts. National governments can support these bottom-up efforts by acting on three fundamental levels: systemic, structural and enabling. Acting on these levels simultaneously is needed to avoid trade-offs between agendas and approaches. Government authorities need to work on the systemic level of change, promoting cooperation, innovation and interaction between actors and all sectors and removing those barriers that are currently hindering actors in achieving change and scaling up their efforts. This was clearly demonstrated in the rural landscape configuration where government authorities were suggested to support the creation of a local partnership and roll out financial tools for local investment. Governments must enable and support all historically marginalised and oppressed groups, such as indigenous peoples and local communities. They can enable them by creating opportunities for innovation and empowerment as well as by strengthening capacities. This can be done, for example, by supporting national action agendas. Providing insight into the co-benefits of biodiversity action for other societal goals may provide greater traction for ambitious biodiversity policy, as is shown in the urban context in the links with public health.

This must be coupled with action to alter the structural elements that are currently impeding a just transformative change. Importantly, government authorities have a fundamental role in halting and changing current unsustainable practices and policies, thus working towards nature-positive and zero-fossil economies, amongst other things. Specifically with respect to the supply chain configuration, government authorities need to put policies in place to stop the further destruction of biodiversity hotspots that is caused by commodity trading. Another way of dealing with structural change is for government authorities to create and implement policies that recognise the multiple values of nature as a way of preventing a too-narrow focus on the economic value of nature. In all three configurations, government and international policy should support indigenous peoples and local communities.

The contribution of the CBD post-2020 Global Biodiversity Framework to strengthening whole-of-society approaches.

To achieve the CBD 2050 vision of living in harmony with nature as well as the new goals and targets for 2030, the new global framework on biodiversity governance needs to support national governments as well as the whole of society.

While the importance of whole-of-society approaches for biodiversity is increasingly being recognised, this still needs further attention on an international level, as an integral part of CBD's implementation mechanisms. This may include strengthening the Action Agenda for Nature and People and supporting national action agendas. In this respect, high-level champions can play an important role, also in connecting national and international level action. In addition, aligning with international, national and sub-national goals and policies on climate, food security, sustainable production and consumption and other SDGs and integrating them in nature-positive development strategies is essential. This would also create opportunities for orchestrating non-state efforts in other policy domains. Alongside integrative and inclusive governance processes, experimenting with the inclusion of non-state actors and sub-national government in CBD peer-review processes will help strengthen learning and enabling approaches to attain the new post-2020 goals and targets. Accountability mechanisms that provide insight into the contributions by non-state actors and sub-national government towards achieving the post-2020 goals and targets should also be strengthened further. This is especially important to ensure visibility and credibility of whole-of-society contributions to the goals of the CBD.

Main Findings: Exploring nature-positive pathways

Setting the scene

From halting biodiversity loss to also restoring nature …
Given the lack of progress towards achieving internationally agreed goals on biodiversity since 1992, a fundamental change in international and national biodiversity policy is crucial. In 2018, the UN Convention on Biological Diversity (CBD) started negotiations to agree on a new global governance framework for biodiversity. A shift is taking place in defining the objectives of biodiversity policy, from halting biodiversity loss to also restoring nature.

… requires transformative change.
Neither business-as-usual nor incremental changes to the ways in which nature is governed can reverse the trend of biodiversity loss. Nature-positive development can only be achieved through transformative change, a process that will change the underlying societal factors (indirect drivers, root causes of biodiversity loss) that drive development. This includes changing institutions, governance structures, power relationships, paradigms, goals and values (e.g. globalisation, the paradigm of economic growth, values of nature, the relationships between humans and nature). Tinkering around the edges and implementing minor changes will simply not stop further biodiversity loss, let alone promote nature-positive development.

Increasing the contributions that benefit nature from non-state actors and local government provides an important opportunity for realising transformative change.
A new element in CBD's post-2020 global framework on biodiversity governance is its emphasis on a whole-of-society approach for biodiversity policy, next to its traditional focus on government conservation policy. While the inclusion and participation of societal actors in governing nature is nothing new, a whole-of-society approach to change recognises and builds on a society-wide mobilisation of actors. Over the past years, there has been an increase in the contributions from non-state actors and local government (e.g. cities, regions, companies, NGOs, and indigenous peoples) to conserve and restore nature and, historically, certain stakeholders, such as indigenous peoples and local communities,

have already been doing so for a long time. The post-2020 framework could build on this 'groundswell of action' to strengthen implementation, as this would help to create momentum for biodiversity on all levels of society and will empower societal actors. The question is, however, whether the efforts of all of these actors are adequately acknowledged, supported and scaled up by national and international institutions, and, if not, how this could be achieved.

Overview of this study

This report has three **objectives**:

- To show what efforts are needed and what pathways are possible to achieve nature-positive goals;
- To show what non-state actors and local government authorities are already doing to contribute to achieving nature-positive goals in three configurations: rural landscapes, supply chains, and cities;
- To show how national governments and international policies can tap into and support these societal efforts towards CBD's post-2020 goals and targets and its 2050 vision of living in harmony with nature.

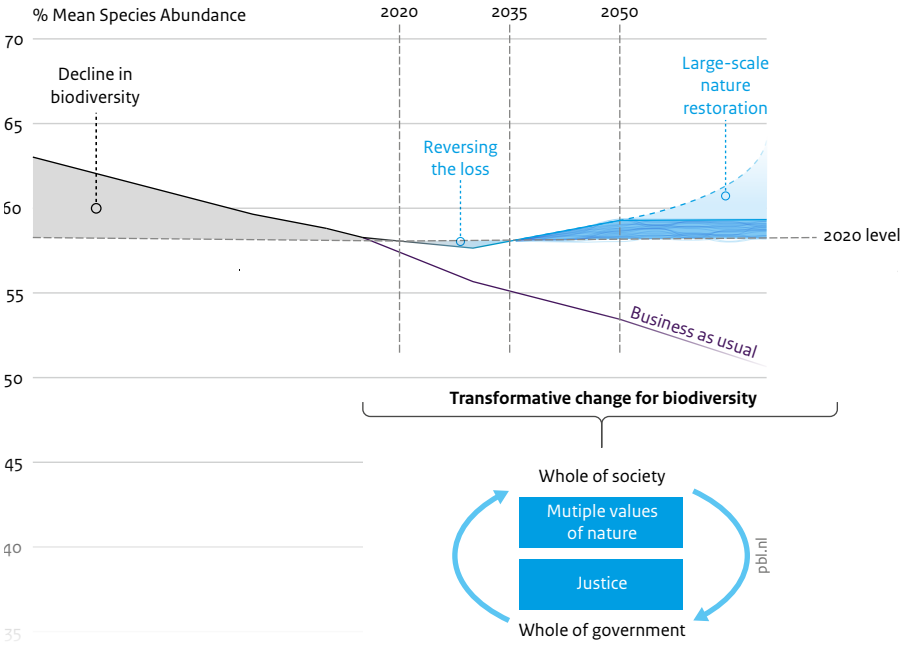
This report can help national and international policymakers to understand how to mobilise, further support and catalyse cooperative biodiversity initiatives by all of these actors.

Approach

This study combines a quantitative model-based analysis of alternative pathways to meet the objective of a nature-positive future, with a governance analysis based on a whole-of-society approach. For this report, we used two recently developed conservation and agriculture scenarios — Half Earth and Sharing the Planet — to elaborate on what efforts are required to achieve nature-positive goals. Both these scenarios meet ambitious biodiversity, climate and food security goals, but differ in the ways they achieve them, as they are premised on different conservation strategies and values of nature. These scenarios show what nature-positive development pathways can look like on a global level. The scenario analysis leaves open the question of how these efforts can be realised on the ground. To answer this question, this report focuses on three specific configurations of societal actors: rural landscapes, supply chains and cities. These configurations are networks where non-state actors and local government authorities are considered together with different types of nature (e.g. agricultural lands, wild areas, urban parks). For these configurations, this report explores a) the implications of nature-positive developments on the ground and how these developments are already emerging from the actions by all of these actors; b) what strategies they are already developing; and c) what national governments could do to support these on-the-ground efforts.

Figure MF.1

Pathways to a nature-positive future



Bron: PBL

Pathways to a nature-positive future. Transformative change as conceptualised in this report becomes possible when efforts by all stakeholders from society and government build on the multiplicity of nature's values and include justice in working towards a nature-positive future. This requires productive links between whole-of-society and whole-of-government approaches.

A whole-of-society approach to pursue nature-positive development

Nature-positive objective can serve as a guiding concept for biodiversity policy, which needs to pay attention to multiple values of nature.

A nature-positive approach means reversing nature loss to enable a net positive improvement by 2030 (i.e. achieving more biodiversity and nature by 2030 than we have today, using 2020 as baseline), and full recovery by 2050 (requiring large-scale restoration of nature). This shifts the objective from halting biodiversity loss to reversing it and restoring nature also beyond conservation areas. A nature-positive approach is increasingly acknowledged by many societal actors and by science as having the potential of becoming a guiding concept, a 'pole star' for biodiversity policy, something for stakeholders to gather around with their visions, commitments and actions. As such, the objective of achieving a 'nature-positive future' could become the guiding objective for biodiversity policies worldwide, equivalent to the climate objectives of 'net zero' or 'climate neutral'.

This report suggests that the nature-positive objective is coupled to a framework that considers the multiple ways in which people value and depend on nature for their livelihoods and well-being. Nature-positive development can only truly be positive when it works for both nature and people and includes the various ways that people live with and care for nature. It follows that nature-positive developments should integrate conservation targets to reverse biodiversity loss by 2030 and restore nature with targets of supporting and maintaining nature's contributions to people in both its biophysical (provisioning, regulating and supporting services) and socio-cultural components. This is considered a critical step on the way to thriving nature and people thriving with nature and one that this report explores in the following chapters (see Figure MF 1).

A whole-of-society approach can build on actions already taking place for nature by non-state actors and local government.

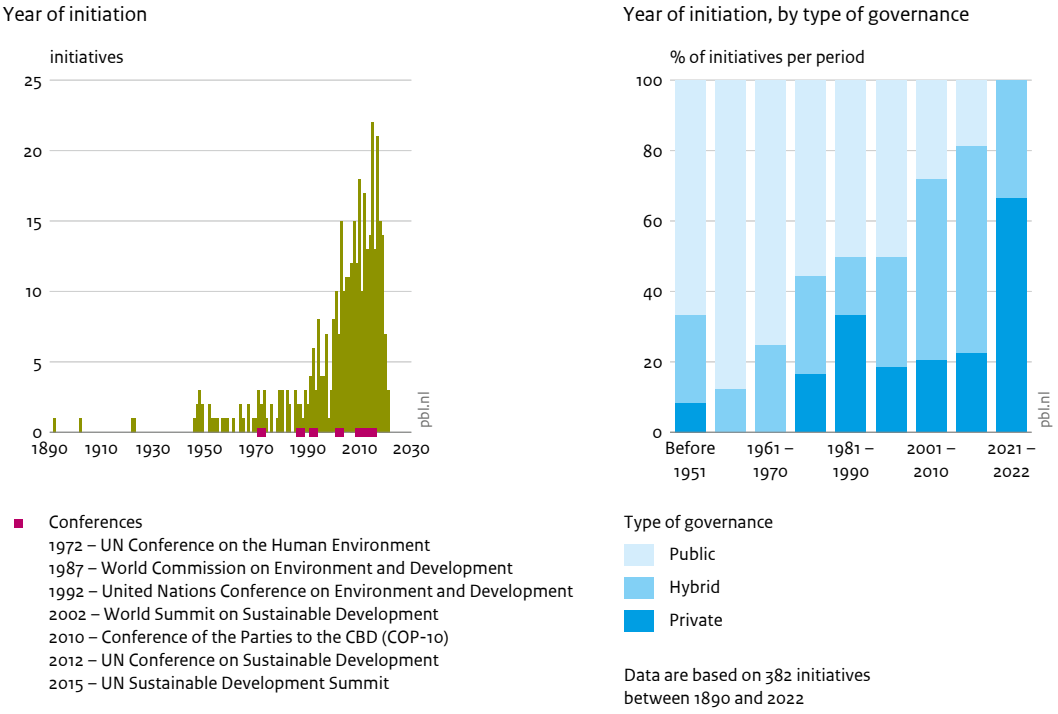
A whole-of-society approach is a governance objective to realise nature-positive development pathways, and more broadly sustainability, which arises from the urgency of bending the curve of biodiversity loss and aligns with multiple and increasing calls for inclusiveness and equity. It is characterised by a society-wide mobilisation of societal groups, resources and narratives that is already happening on the ground (as illustrated in Figure MF.2 for the international level) towards shared biodiversity and sustainability goals: a groundswell of action that needs to be acknowledged, supported and enabled. Whole-of-society approaches have become increasingly popular in multiple policy discussions over the past years, for example those on public health and risk management, climate and energy. Within the field of biodiversity conservation governance, non-state actors on sub-national levels have not only been active in direct conservation efforts, but also have become more influential in the policy arena, providing a range of governance functions, such as standard-setting, networking, knowledge creation and dissemination, and finance. These functions are needed for the type of action that addresses direct and indirect drivers of biodiversity loss. A whole-of-society approach creates opportunities for new, transformative ways of governing nature.

Recognising multiple values of nature and justice provides an opportunity to strengthen whole-of-society approach.

A whole-of-society approach to change requires national governments to recognise and support the multiple ways actors value nature, depend on nature and integrate nature in their operations and activities. As clearly stated by the recent IPBES methodological assessment on values (IPBES, 2022), the way nature is valued through policies matters a great deal for the success of transformative change, while historically a narrow focus on the economic value of nature has dominated policy. This has overshadowed the multiple ways people value and depend on nature, resulting in material and cultural injustices. Expanding the ways nature is valued in biodiversity policies is therefore essential to mobilise actors around the biodiversity targets. Along with a redistribution of resources and power, this could result in an empowerment of a multitude of actors in decision-making about nature that have traditionally been marginalised and excluded from and oppressed by biodiversity policies. This report analyses the potential of this approach within the three configurations covered in this report.

Figure MF.2

International cooperative initiatives for biodiversity



Source: IVM/PBL Biostar 2.0

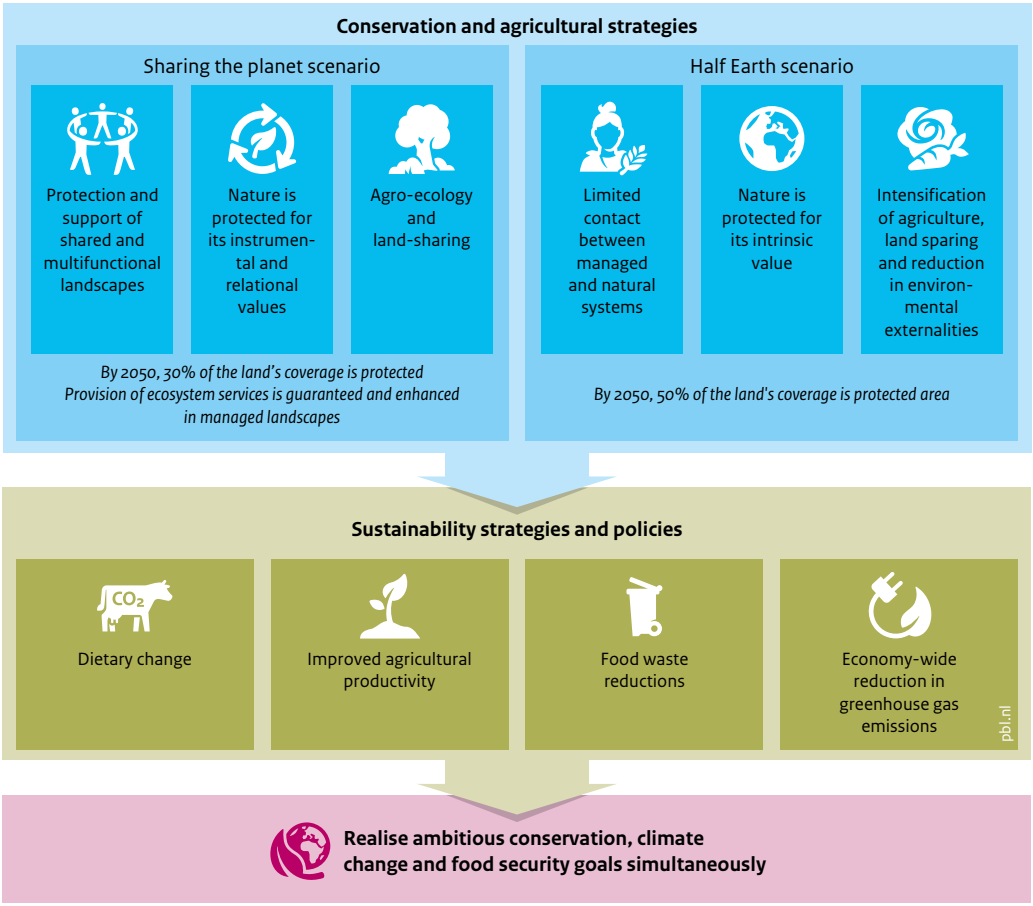
Increase in international cooperative initiatives on biodiversity. Private hybrid (public– private) collaborations have become more prevalent, next to public initiatives.

Ambitious conservation efforts need to be combined with broader sustainability efforts

Alternative nature-positive pathways: Half Earth and Sharing the Planet.
Multiple pathways are possible to realise nature-positive developments, as different values of natures can be prioritised and result in different approaches to conservation and sustainable use. The Half Earth and the Sharing the Planet scenarios represent two alternative, solution-oriented scenarios for nature where intrinsic, instrumental and relational values of nature are given different weights to orient the conservation strategy (see Figure MF.3). Despite different conservation strategies, both scenarios are developed (and then quantitatively assessed) to ensure that they simultaneously achieve ambitious biodiversity, climate and food security goals. This shows that alternative pathways exist to achieve nature positive and they can work in parallel in different spatial contexts — although providing different results on the kind of nature that is protected and on other societal factors, such as food security. This result highlights the importance of considering a multiplicity of values of nature when discussing about how to achieve ambitious goals.

Figure MF.3

Conservation, agriculture and sustainability strategies to inspire nature-positive pathways



Source: PBL

Sharing the Planet and Half Earth: alternative strategies for nature-positive development. The strategies differ in how nature is conserved and to what extent. Both, however, are subsequently coupled with the same sustainability policy package that is necessary to bend the curve of biodiversity loss.

Conservation efforts alone will not bend the curve of biodiversity loss, but requires broader set sustainability measures being employed, especially strong climate change mitigation measures in energy and food systems.

The quantitative analysis of Half Earth and Sharing the Planet scenarios shows that expanding conservation efforts to protect larger swaths of land and sea — even to the point of the protection of 50% land surface under the Half Earth scenario — will not succeed in bending the curve of biodiversity loss and; on the contrary, it might increase trade-offs

between conservation and other sustainability objectives, such as food security. In the quantitative analysis, it was found that complementary sustainability measures had to be combined with ambitious conservation action to achieve nature-positive development. This package of measures includes ambitious climate mitigation action, including dietary changes away from meat and dairy consumption, changes in agricultural production and food consumption. Particularly, consumption change and demand side management are key to avoid trade-offs for nature in combined biodiversity,climate and food security policy agendas. The remainder of this summary addresses the question of how, in the three configurations covered in this report (see Figure MF.4), transformative change towards nature-positive development may be realised.

Rural landscapes are key to any nature-positive transformation

Because of the multiplicity of sectors, ecosystems and political agendas, rural landscapes are contested areas where multiple actors compete to shape and govern them.

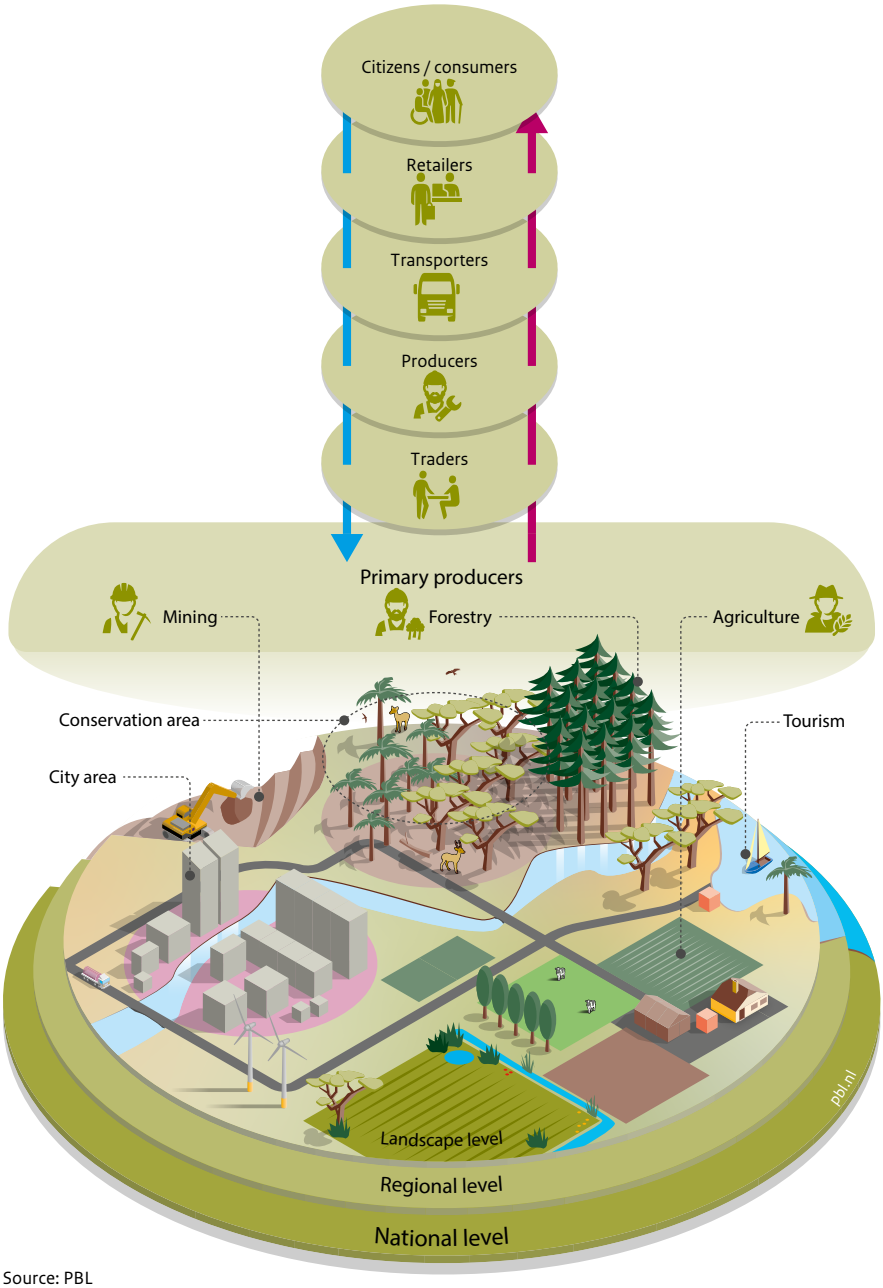
Globally, urbanisation trends are emptying rural areas with the exit of their inhabitants, across both the Global North and South, while growing urban areas become all the more tightly dependent on and connected to a rural hinterland for the provision of resources and nature's contributions to people. Because rural areas contain key biodiversity hotspots and food production systems and host a variety of other human activities, they are crucial to sustainability agendas. The Half Earth and Sharing the Planet scenarios show that there are multiple pathways to transformative change in rural landscapes and highlight that different types of rural landscapes may emerge from the integration of multiple values of nature, needs and visions. Regardless of these different visions — which will be negotiated on a landscape level, local actors in rural landscapes are already actively involved in nature-positive development. National governments and international policies at the CBD can tap into these efforts on a rural level and further harness the potential of local landscape approaches.

Moving away from sectoral policies towards integrated rural landscape approaches is key to achieving nature-positive development.

Sectoral approaches often fail to integrate the various sectors and ecosystems of rural landscapes — characterised by the co-existence of conservation, agriculture, tourism, forestry and other sectors. Landscape approaches have become increasingly popular in the debate around sustainable development, conservation and climate change mitigation, since the landscape has been recognised as a relevant spatial unit of action and integration for these agendas. Landscape approaches involve the integration of the sectors that are typically present in rural landscapes and multiple stakeholders, to combine managed and natural ecosystems and include multiple landscape values (natural, economic, cultural, spiritual, historical, heritage-related, nutritional and others) as a strategy for dealing with the various stakeholder interests, preventing trade-offs and optimising synergies towards a nature-positive future and overcoming siloed sectoral approaches.

Figure MF. 4

Configurations of actors in the landscape



Source: PBL

The three configurations covered in this report: rural landscapes, supply chains, and cities.

Integrated rural landscapes governance requires inclusive and participatory frameworks to tap into the potential of a whole-of-society approach.

Current landscape governance, too often, is a top-down process imposed on territories with little possibilities for local actors to have an impact in the decision-making process. Landscape approaches are therefore an answer to the increasing call for inclusivity from multiple actors and to the need for platforms where multiple stakeholders can collectively decide about the territory they live and work in. Landscape approaches can help to design deliberative and inclusive processes, and provide an inclusive and participatory framework that can stimulate actors to work together and become aware of the benefits of improving rural landscape sustainability. Especially at the landscape level, stakeholders can come together, put forward their needs, negotiate and take action towards nature-positive development.

Integrated rural landscape governance needs to deal with power imbalances between sectors, stakeholders and interests.

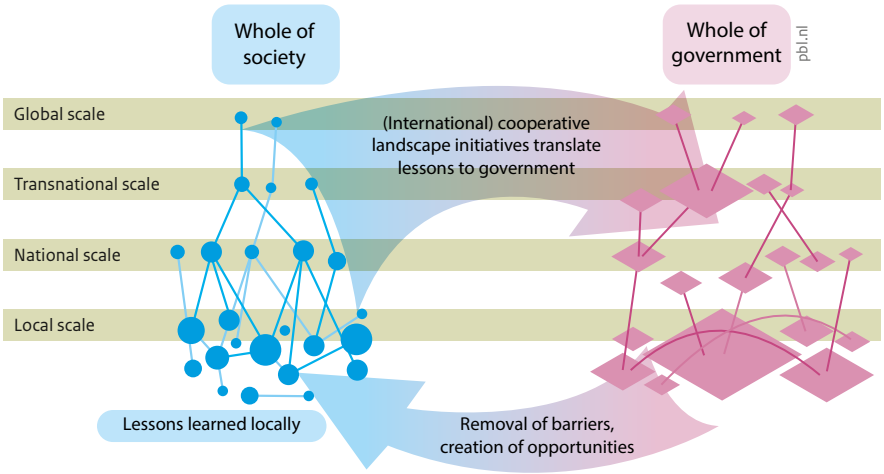
The mere creation of participatory and inclusive arenas for discussion is not enough to ensure that all actors have a real say in — and impact on — the way decisions are taken and implemented. The struggle of IPLC against mining activities or large-scale, export-oriented agriculture are only some examples of the power struggles that can exist between and within local needs and definitions of what a rural landscape should look like and external actors who may want to use that landscape. Given power imbalances, landscape approaches will not only have to create inclusive platforms for dialogue but also need to address root causes and allow for a reconfiguration and change of institutional practices, such as the way resources are allocated between actors or how decisions are taken on the rural landscape.

National and international support needed to make landscape approaches more effective.

Designing landscape approaches for rural areas requires the support from national governments and international institutions in different ways (as illustrated in Figure MF.5). Governments can facilitate the creation of landscape partnerships between local actors and political and administrative territorial structures via, for example, changes to the legal system. They could facilitate institutional technical assistance for landscape and territorial partnerships and provide opportunities for local stakeholders to share knowledge, and create solidarity and reciprocal support. Governments could support innovation in financial systems and tools for local investment. Governments can organise the process of land-use planning, secure land tenure and implement environmental regulations to facilitate and empower the outcomes of the negotiations between actors.

Figure MF.5

Collective definition and implementation of nature-positive pathways through integrated landscape approaches



Source: PBL

Nature-positive pathways on landscape level refer to the interactions between local and global levels and non-state and state actors. Lessons can be learned from local landscape initiatives that can then be applied on all scales, thanks to the mediation of international networks of cooperative landscape initiatives. Lessons can be translated into actions for government authorities, on various levels, to act on removing barriers and create opportunities for change.

Supply chain action is needed for business and finance to contribute collectively to the nature-positive objective

To achieve transformative change, economy-wide transitions are required in the consumption, processing and production parts of supply chains.

Collective action along supply chains by actors from various economic sectors, knowledge institutions and governments is needed, in order to harness the full potential of a whole-of-society approach. This calls for alignment and orchestration of individual actors and actions. Product and resource supply chains provide a logical and potentially effective configuration of actors to organise such a cooperative challenge. In this way, companies with both direct and indirect (upstream and downstream) links to the drivers of biodiversity loss can be targeted.

There is large potential for business and finance to contribute to the nature-positive objective, guided by the conservation hierarchy.

Many measures are available to companies and can be structured as a hierarchy for stepwise implementation. These measures range from avoidance to mitigation, restoration and compensation, with types of actions that help to change current impacts. By itself, such a

stepwise approach to changing existing businesses will not be enough to reach a net-positive situation. Rethinking and reforming current production structures are also needed for transformative change to take place.

Leverage can be found in collective action, combining the abilities of individual actors their complementary potential and spheres of influence, both in supply chains and production landscape. Companies will not be able to apply all solutions, measures and innovations by themselves, as they have different capacities, abilities and motivations for change. Nor do they operate in isolation but are connected with other companies through the various supply chains. These chains for different consumption domains (food, energy and materials) provide a logical and potentially effective configuration of addressing the cooperative challenge of reducing impacts and changing economic consumption and production patterns. A cooperative and whole-of-society approach can partly be built on the measures identified in the conservation hierarchy, on the innovative capacity of front runners, and on the numerous sustainability initiatives by international cooperatives in which companies work together with other societal actors to access knowledge and define sustainable operating standards.

Fundamental changes in existing business models are needed to achieve the nature-positive objective. In addition to reducing environmental pressures, more fundamental changes are also needed in the way that businesses operate. Examples include changing food consumption patterns (innovative sources of protein), and radical changes towards a more circular use of resources, such as biomass, materials and nutrients (e.g. reuse and recycle). Such systemic changes have to be stimulated, while high costs and other barriers to changing existing production structures have to be overcome. The financial sector has an important role in making these changes possible, not only by managing financial risks from environmental degradation in existing business models, but also by investing in innovations and supporting the related new business models.

Governments should also take the motivational factors of companies into account.
In choosing policy instruments to activate companies in supply chains, their motivations are key.
The instruments need to be targeted at the actors that are directly or indirectly responsible for biodiversity loss. Policies for stimulating new practices aimed at innovation and those at discouraging and disrupting currently unsustainable practices need to be combined. Such policies have to be targeted at companies with distinct sustainability strategies that are active in different phases of the transformative change process
(see Figure MF.6). The international character of many supply chains calls for a governance approach that takes historical, cultural and welfare differences into account; also because there are different jurisdictions involved. Special attention needs to be paid to a fair distribution of the costs and benefits of changing current production practices in such cross-border settings. For this, cooperation between national governments is necessary, combining incentives and rewards for consumers, retailers and manufacturers in the Global North with those of traders and producers in the Global South.

An important example of a governance challenge for supply chains for agro-commodities is to make them deforestation-free.
In the past few decades, there have been many voluntary initiatives to guarantee the sustainability of production practices, based on broadly accepted market standards. But relying on the use of these certification systems is not sufficient, as decades of practical experience have revealed several shortcomings. An effective international approach requires a combination of measures with actor involvement from both the supply and demand side. In this multi-actor, multi-level setting, a combination of regulatory, financial and soft instruments have to complement each other, and overcome the shortcomings of single approaches. Insights into how the various instruments of non-state and state actors can be combined can be obtained by closely following the effects of current policy developments towards establishing deforestation-free supply chains for agro-commodities.

Cities are crucial arenas for biodiversity action within and beyond city boundaries

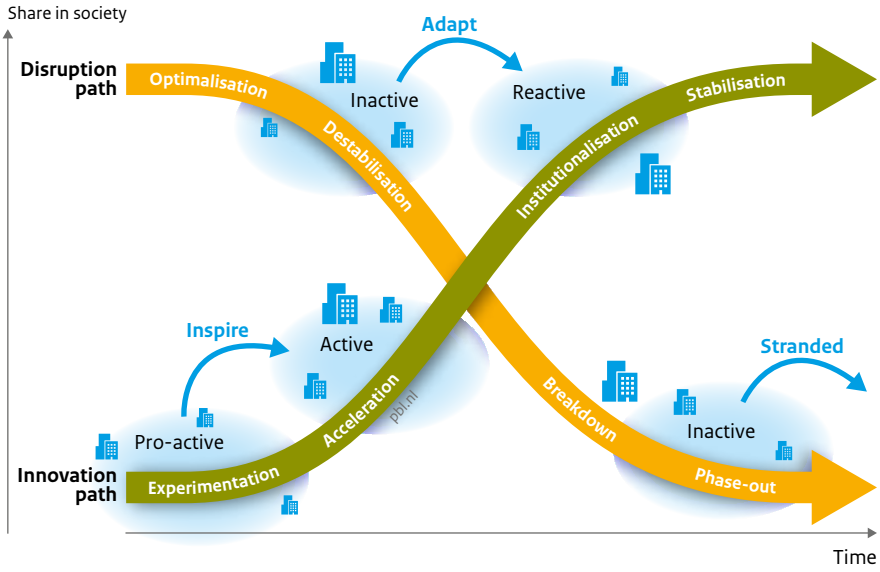
An increasing number of cities engage in nature conservation and restoration and are thriving with nature.
Cities and urban stakeholders often recognise and deploy the multi-functionality of nature based solutions for simultaneously dealing with multiple urban sustainability issues (e.g. climate change, public health and loss of biodiversity). Yet, current urban planning and design often are still not nature-positive and tend to favour the development and management of traditional 'grey' infrastructure, such as roads. Therefore, transformative change in urban development towards nature positive requires fundamental shifts in the 'urban infrastructure regime'.

Focusing on urbanisation as a 'threat' tends to ignore city dynamics which address both direct and indirect drivers of biodiversity loss.
While urbanisation's impact on biodiversity is an important concern that needs to be addressed, a focus on how urban growth and land conversion threaten biodiversity tends to ignore the importance of city dynamics, including a range of actors, such as those in city networks addressing both direct and indirect drivers of biodiversity loss. Some initiatives are contributing directly to conserving and restoring biodiversity, whereas others are contributing in more indirect ways, such as through climate mitigation or land-use changes. By tackling these drivers of biodiversity loss in multiple ways — from land-use change to climate change — cities are contributing to nature-positive trajectories within and beyond city limits.

Pathways of synergistic actions are needed to transform urban infrastructure regimes.
Despite the increasing deployment of urban nature in cities, there are also barriers to urban greening (e.g. limited private sector investment) which can only be overcome by targeting the underlying structural conditions (e.g. lack of a public mandate).

Figure MF.6

The role of different company strategies in transformative change



Source: DRIFT Erasmus 2018; Van Tulder Erasmus RSM; Adaptation by PBL

The role of companies with differing biodiversity strategies in transformative change, ranging from inactive, reactive, active to pro-active.

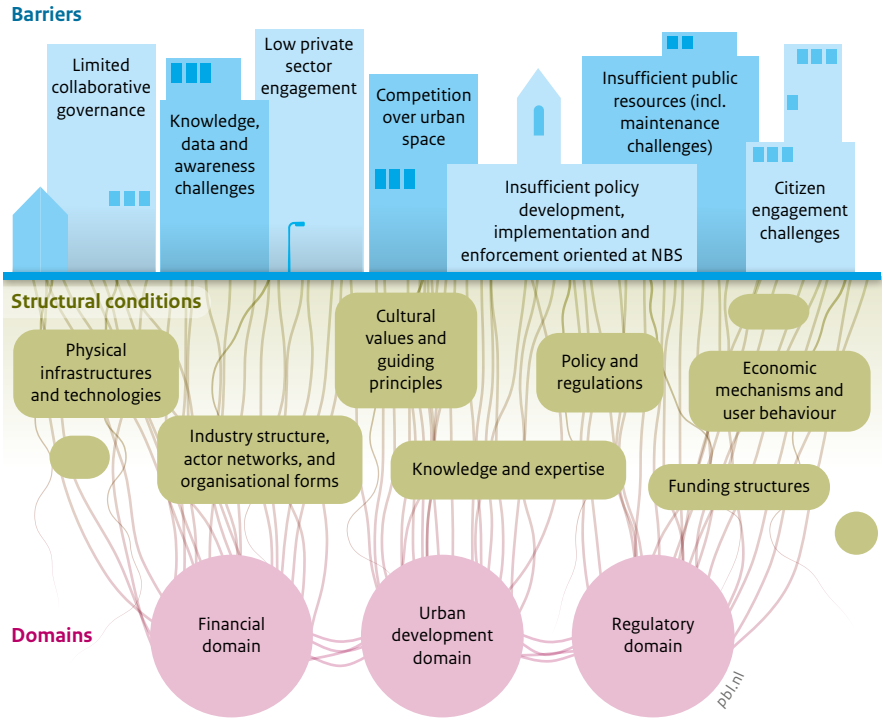
Therefore,transformative change in urban development towards a nature-positive future will require fundamental shifts in the 'urban infrastructure regime'. Moving forward requires the engagement of the various actors on the aspects of regulation, urban development and finances of the urban infrastructure regime — fundamentally changing the ways in which cities develop and function (see Figure MF.7). Combinations of various smaller efforts (or, what we call stepping stones), such as establishing partnerships and community-based action, are needed to generate a combined, transformative impact — the whole is greater than the sum of its parts. Policymakers could create their own specific pathway by identifying pivotal stepping stones, based on their particular policy context, to key actions that would enhance urban nature.

Urban greening may exacerbate socio-spatial inequities — it is necessary to design deliberative and inclusive processes to overcome uneven and inequitable urban nature provision.

In the pursuit of a nature-positive future, it is essential to acknowledge the unequal distribution of urban nature within cities as well as the risk of new nature-positive interventions also leading to such inequalities. Urban greening may exacerbate socio-spatial inequities, displacing marginalised communities as a result of higher real estate prices. Overcoming these inequalities requires challenging existing power relationships between urban actors and socio-economic conditions, engaging local communities and stakeholders as well as embracing plural values of nature and related practices.

Figure MF.7

Urban infrastructure regimes across the regulatory, urban development and financial domains



Source: Dorst et al. 2022

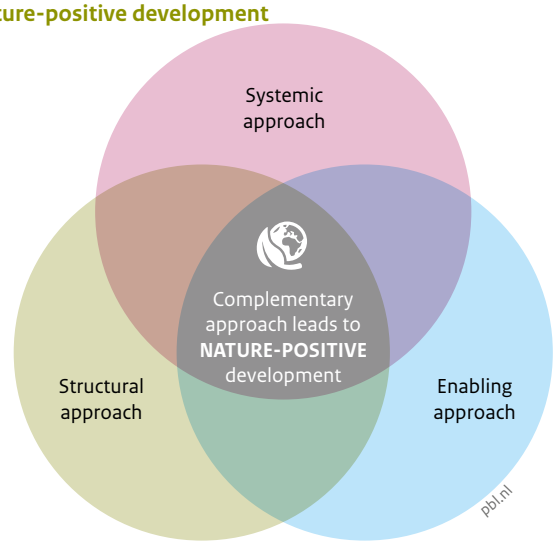
Regulation, urban development and finances are the three fundamental aspect of an urban regime (referred to as domains). Each aspect has its structural elements which may form certain barriers. Policies should not simply address those barriers, but rather should focus on the structural conditions that are causing those barriers.

Policymakers have to adopt combinations of regulatory, economic and soft policy instruments to support nature-positive urban development.

A range of regulatory, financial and soft governing mechanisms to support nature-positive development are available to national and international policymakers, such as implementing regulations, agreeing on financial rewards, sharing knowledge and entering into voluntary agreements. Combining these mechanisms is essential for generating transformative impacts; the requirements for achieving multifunctional benefits could for instance be accompanied by financial rewards. Moving forward requires combining these governing mechanisms while also providing scope for non-governmental action, creating cities where people and nature can thrive together.

Figure MF.8

Combining structural, systemic and enabling approachs towards transformative changes for nature-positive development



Source: PBL

Combing systemic, structural and enabling approaches towards transformative change for a nature-positive future.

Ways to enable ambitious whole-of-society approaches to transformative change for biodiversity

National policies need to combine systemic, structural and enabling approaches to transformative change for a nature-positive future.

Many societal actors worldwide are already mobilising to take action on biodiversity, yet, specific national government policies and policy instruments should enable non-state actors and local and regional government authorities to accelerate and scale up their efforts. Governments can support such bottom-up efforts by acting on three fundamental levels (see Figure MF.8), which need to be tackled simultaneously. Failing to do so would cause trade-offs and would probably hinder the potential for transformative change. Governments need to work on the systemic level of change by encouraging interactions between the actors to achieve complementary actions within and between configurations, and removing those barriers that are currently hindering actors in achieving change and scaling up their efforts. This was shown in the rural landscape configuration by the creation of local partnerships and the roll out of financial tools for local investments. This needs to be combined with enabling and supporting historically marginalised and oppressed groups, such as indigenous peoples and local communities. Governments could create opportunities for innovation and empowerment by providing resources and improving the preconditions for change. This can be done, for example, through supporting national action agendas that can contribute to the initial stages of transformative change and be

coupled with action to alter the structural elements that are currently impeding just transformative changes. Governments, amongst others, need to create and implement policies that recognise the multiple values of nature as a way of preventing a too-narrow focus on the economic value of nature, as was found in the recent IPBES value assessment. Policies for a nature-positive approach must urgently consider the multiple ways people value nature — to enable a wide range of historically marginalised and oppressed groups, as well as act on the structural bias of the current economic system of considering nature only as an economic asset. Furthermore, government authorities must redistribute material resources to also include the historically marginalised stakeholders who have long since been acknowledged to be essential in biodiversity conservation, such as indigenous peoples and local communities. To act on the structures that currently hinder transformative change, government authorities need to unmake current unsustainable policies and put a stop to unsustainable practices. Transformation is simply not only about innovation but also about unmaking that which is not working. For example, government policies on a zero-fossil and nature-positive economy, must also rule out fossil-fuel extraction.

Whole-of-society approaches need further development, as an integral part of CBD's policies.
To achieve the nature-positive objective and the CBD 2050 Vision of people living in harmony with nature, the related policy-making for a nature-positive future must be supported in inclusive and integrative ways. Moving forward requires government biodiversity policies that go beyond those that only address the direct drivers of biodiversity loss, to those that also tackle the indirect drivers, taking a whole-of-society approach and involving all levels of government, as is required to achieve transformative change.
The importance of whole-of-society approaches for biodiversity is increasingly being recognised, although this needs further development as an integral part of CBD's implementation mechanism, including a further strengthening of CBD's Action Agenda for Nature and People and supporting national action agendas. In addition, aligning and integrating nature-positive development strategies with international, national and sub-national goals and policies on climate, food security, sustainable production and consumption and other SDGs is essential, also for enhancing non-state action. The action agendas of CBD, UNFFF and the Agenda 2030 (SDGs) could be brought together in a 'race to net zero and nature-positive' futures. Alongside integrative and inclusive governance processes, experimentation that fosters innovative, diverse and alternative approaches can help to attain nature-positive goals and is given a mandate through the post-2020 global biodiversity framework. In addition to learning approaches, this also calls for a further strengthening of accountability mechanisms that provide insight into the contribution of non-state actors and local and regional government authorities. This is especially important to ensure visibility and credibility of whole-of-society contributions to CBD's goals, which could be supported through capacity-building approaches that emphasise demonstration projects, living laboratories and partnerships across various sectors while fostering interregional learning.

Publications CBD Post-2020 process[1]

Kok M, Rankovic A, Löwenhardt H, Pattberg P, Prip P, Widerberg O and Laurans Y. (2018). *From Paris to Beijing. Insights gained from the UNFCCC Paris Agreement for the post-2020 global biodiversity framework*. PBL Policy Brief, PBL Netherlands Environmental Assessment Agency, The Hague.

Kok M, Widerberg O, Negacz K, Bliss C and Pattberg P. (2019). *Opportunities for the Action Agenda for Nature and People*. PBL Policy Brief. PBL Netherlands Environmental Assessment Agency, The Hague.

Pattberg P, Widerberg O and Kok MT. (2019). Towards a global biodiversity action agenda. *Global Policy*, 10(3): 385–390. Bhola N, Klimmek H, Kingston N, Burgess ND, Soesbergen A, Corrigan C, ...and Kok MTJ. (2020). Perspectives on area-based conservation and what it means for the post-2020 biodiversity policy agenda. Conservation Biology.

Immovilli M and Kok MTJ. (2020). *Narratives for the 'Half Earth' and 'Sharing the Planet' scenarios; a literature review*. PBL Netherlands Environmental Assessment Agency, The Hague.

Leclère D, Obersteiner M, Barrett M, Butchart SH, Chaudhary A, De Palma A, ... and Young L. (2020). Bending the curve of terrestrial biodiversity needs an integrated strategy. *Nature*, 585(7826), 551–556.

DNB and PBL (2020). *Indebted to Nature*. De Nederlandsche Bank en PBL Netherlands Environmental Assessment Agency, Amsterdam and The Hague.

Van Oorschot M, Kok M and Van Tulder R. (2020). *Business for biodiversity: mobilising business towards net positive impact*. PBL Policy Brief. PBL Netherlands Environmental Assessment Agency, The Hague.

Bulkeley H, Kok M, Van Dijk JJ, Forsyth T, Nagy G and Villasante S. (2020). *Moving Towards Transformative Change for Biodiversity: Harnessing the Potential of the Post-2020 Global Biodiversity Framework*. An EKLIPSE Expert Working Group report. UK Centre for Ecology & Hydrology.

Kok M, Meijer J, Van Zeist W, Hilbers J, Immovilli M, Janse J, Stehfest E, Bakkenes M, Tabeau A, Schipper A and Alkemade R. (under review). *Assessing ambitious nature conservation strategies within a 2 degree warmer and food-secure world*, Wageningen University & Research, Wageningen.

Bulkeley H, Kok M and Xie L. (2021). *Realising the Urban Opportunity: Cities and Post-2020 Biodiversity Governance*. Policy Brief. PBL Netherlands Environmental Assessment Agency, The Hague.

Bulkeley H, Kok M, and Van Dijk J. (2021). *Embedding transformative change in global biodiversity governance*. Policy Brief, Post-2020 Biodiversity Framework-EU Support project.

[1] Overview of PBL publications, as well as external publications with strong PBL involvement, in support of the CBD post-2020 process (2018–2022).

Van der Esch S, Sewell A, Bakkenes M, Berkhout E, Doelman J, Stehfest E, Langhans C, Fleskens L, Bouwman A and Ten Brink B. (2021). *The global potential for land restoration: Scenarios for the Global Land Outlook* 2. PBL Netherlands Environmental Assessment Agency, The Hague.

Kok M and Ludwig K. (2021). Understanding international non-state and subnational actors for biodiversity and their possible contributions to the post-2020 CBD global biodiversity framework: insights from six international cooperative initiatives. *International Environmental Agreements*. DOI: 10.1007/s10784-021-09547-2

Meijer J, Van Oosten C, Subramanian SM, Yiu E and Kok M. (2021). *Seizing the landscape opportunity to catalyse transformative biodiversity governance.* Policy Brief. PBL Netherlands Environmental Assessment Agency, The Hague.

Widerberg OE, Kok MT, Negacz KK, Petersson M and Pattberg PH. (2021). *Holding non-state actors accountable for their commitments in the CBD post-2020 Global Biodiversity Framework.* Policy brief. IVM Institute for Environmental Studies and PBL Netherlands Environmental Assessment Agency, The Hague.

Leadley P, Gonzalez A, Obura D, Krug CB, Londoño-Murcia MC, Millette KL, … and Xu J. (2022). Achieving global biodiversity goals by 2050 requires urgent and integrated actions. One earth, 5(6): 597–603.

Visseren-Hamakers IJ and Kok MT. (Eds.). (2022). *Transforming Biodiversity Governance*. Cambridge University Press. Open Access: https://www.cambridge.org/core/books/transforming-biodiversity-governance/528A21807B7F533EFEABD55EB0FC67F6

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