



PBL Netherlands Environmental
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PLAY THE LONG GAME

Aligning national and international policies for nature and people with the long-term goals of the Global Biodiversity Framework



Colophon

Play the long game. Aligning national and international policies with the long-term goals of the Global Biodiversity Framework

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Corresponding author
marcel.kok@pbl.nl

Authors

Marcel Kok, Roos Immerzeel, Michel Bakkenes, Astrid Bos, Jonathan Doelman, Jelle Hilbers, Pippa Hofman, Ina Lehmann, Montserrat Kolofoon Rosas, Juliette Landry, Katarzyna Negacz, Oscar Widerberg

Supervisor

Martine Uytterlinde

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Abbreviations

Abbreviation	Definition
CBD	United Nations Convention on Biological Diversity
COP	Conference of the Parties
GBF	Kunming-Montreal Global Biodiversity Framework
NBSAP	National Biodiversity Strategy and Action Plan
NCPs	Nature's Contributions to People
NDC	Nationally Determined Contribution (to UNFCCC)
OECM	Other effective area-based conservation measures
ORT	Online Reporting Tool
SMART	Specific, Measurable, Achievable, Relevant, and Time-bound
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change

Summary

At the 17th meeting under the UN Convention on Biological Diversity (CBD) in October 2026, Parties will review their collective progress towards the 2030 targets set out in the Kunming-Montreal Global Biodiversity Framework (GBF) and identify ways to accelerate their implementation. As this marks the first official Global Review within the CBD, Parties (CBD member countries) have to agree on future work to address gaps, challenges, and barriers, and to foster opportunities for implementation. Following the review outcomes, these should be considered in international and national biodiversity policy.

So far, the CBD Global Review process has mainly focused its attention on the delivery of the GBF's 2030 targets in the coming four years (2026-2030), and less on long-term dimensions necessary to achieve the 2050 goals. In order to achieve the 2050 goals, Parties will need to start laying the foundations for long-term, systemic transformations now. This PBL policy brief aims to contribute to strengthening the long-term perspective in the Global Review and to provide guidance for long-term strategies. To achieve that, this policy brief combines governance and scenario analyses. We provide a scenario-based approach to prospectively (*ex-ante*) evaluate policy ambition scenarios for their long-term outcomes towards Goals A 'Protect and Restore' and B 'Prosper with Nature'. We then compare these with analyses of current National Targets and governance considerations in the biodiversity policies and actions of both countries and non-state actors aimed at achieving these goals.

Our scenario analysis shows that implementation of the global ambition in the 2030 GBF targets, as well as of collective ambition reflected in National Targets, will result in a significant improvement in biodiversity. From 2030 onwards, however, this improvement in biodiversity will decline again as climate change impacts as well as other pressures continue to increase. Scenarios implementing the 2030 GBF targets show a stronger improvement in biodiversity than the National Targets scenarios, as collective ambitions in National Targets do not (yet) match the ambitions of the 2030 GBF targets. This indicates a short-term ambition gap. Scenarios that combine the GBF and countries' Nationally Determined Contributions (NDCs) show a possible trade-off between biodiversity and climate policies, driven by the increased demand for bio-energy to meet climate targets. This emphasises the need to further improve policy coherence in the implementation of biodiversity and climate commitments.

Meeting the 2050 GBF goals will require an increase in ambition and implementation beyond the 2030 GBF targets, especially in addressing the direct and indirect drivers of biodiversity loss. Comparing the GBF's 2030 targets with long-term pathways identified in scenarios aimed at achieving the 2050 goals for biodiversity and staying below the 2° Celsius climate goals of the Paris agreement, shows that ambitious action is needed that goes beyond just conserving and restoring nature. This would require major changes in production and consumption systems that address climate and biodiversity together. Such pathways involve transitioning to sustainable food- and agricultural and energy systems while also addressing the external footprints. Shifts towards plant-based diets are an important element in those scenarios. Bending the curve of biodiversity loss can only be achieved when temperature change is limited to well-below 2 °C, while nature-based solutions can provide an important contribution to climate mitigation.

To prioritise pathways that address direct and indirect drivers of biodiversity loss, whole-of-government approaches are necessary, at the national as well as the international level.

Addressing those drivers requires engaging those economic sectors, development priorities, and policy decisions that fall outside of the traditional remit of environmental institutions. This is currently not reflected in National Targets, where attention is mostly focused on the environmental policy domain, as well as conventional conservation and restoration targets. To further operationalise whole-of-government approaches through the lens of transformative change, we suggest to enhance learning amongst countries and non-state actors from long-term transition perspectives (e.g. around agriculture and food systems); reduce the biodiversity footprint of consumption and production through policies that address entire value chains; and strengthen the capacity of the CBD mechanisms, including the Global Review, in order to show progress and inform action across the broader governance architecture relevant to nature.

To develop and implement pathways towards the 2050 goals, Parties can benefit from a more proactive approach to leverage the role of those non-state actors that act as frontrunners in advancing specific pathways for biodiversity. Global biodiversity governance has moved beyond a state-driven multilateral system, with a variety of non-state actors playing an increasing role at all levels of decision-making. So far, these efforts have gone largely unnoticed in the CBD Global Review. Parties should recognise actors such as cities, Indigenous peoples, local communities, business and finance as actors with agency that are actively shaping and co-creating pathways towards the 2050 goals. Government policies at all levels can support and scale up non-state activities. Productive linkages between governments and non-state actors could be built by creating frontrunner coalitions, revitalising the CBD Action Agenda, connecting the CBD with Action Agendas in the United Nations Framework Convention on Climate Change (UNFCCC) and the United Nations Convention to Combat Desertification (UNCCD), and include collective reporting by non-state actors in the second Global Review (taking place at COP-19).

While the Global Review assesses collective progress towards the 2030 targets, achieving the 2050 goals in an effective, efficient, and just way will require the CBD to address contributions and responsibilities across Parties. These responsibilities relate to the contributions Parties make to the GBF through domestic action, the impacts of their production and consumption abroad, and their contribution to international cooperation for biodiversity, including finance. Different distribution principles can be applied to assess how to distribute country-specific contributions, given differences in for example responsibility, capacity, benefits, and needs. Addressing respective country efforts to implement the GBF targets is relevant from an environmental, economic, as well as justice perspective, and can contribute to the legitimacy and success of the CBD. While called for in the GBFs' principles for implementation, it is clear that this will be a sensitive issue within the CBD, addressing these questions can provide a clearer understanding of current and required efforts by Parties across the GBF. As a first step, a dialogue around these topics could be initiated as part of the Global Review process.

Beyond COP-17, the Global Review process can play an important and continuous role in the CBD to help articulating the long-term pathways towards the 2050 goals and identifying opportunities and contributions of state and non-state actors in shaping and realising them. COP-17 can set the general directions for this by providing clear political signals, guiding action, facilitating accountability and learning, addressing responsibilities, and providing a follow-up mechanism towards the post-2030 agenda.

1 Introduction

Context

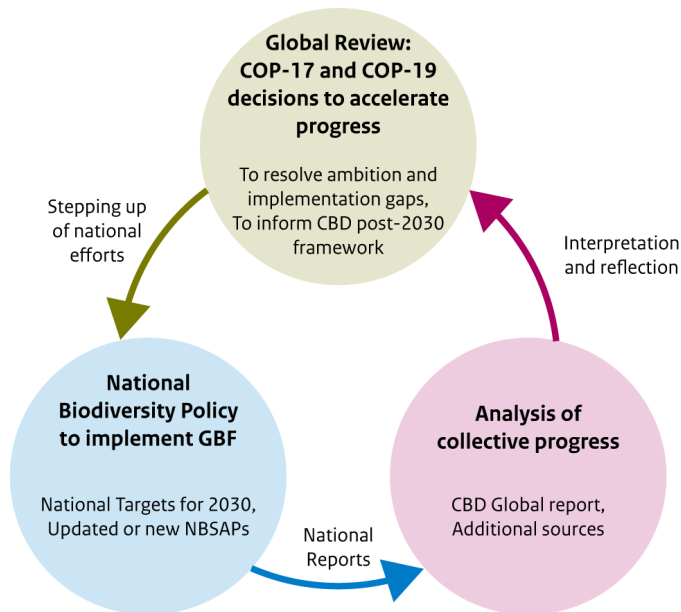
The first Global Review of collective progress in the implementation of the Kunming-Montreal Global Biodiversity Framework (GBF) during the 17th Conference of the Parties (COP) of the Convention on Biological Diversity (CBD) provides a key political moment for countries to turn analysis of progress into political action. Over the past year, a shared evidence base has been built to inform the Global Review process. This generated dialogue amongst Parties (countries that are signatory the CBD) and stakeholders around the current state of implementation, what is holding it back, and, importantly, where acceleration is most needed and how this could be achieved. The CBD Global Report ‘State of Biodiversity Action’ (CBD 2026) positively concluded that the GBF has ‘generated unprecedented global engagement’ and has driven action and innovation to realise its 23 targets. However, the report also clearly acknowledged that unless collective implementation accelerates rapidly, the 2030 targets will not be achieved. The Global Report strongly warned that ‘not meeting the 2030 targets would place achievement of the 2050 goals and vision in jeopardy. As the 2030 targets are the foundation towards achieving the GBF’s 2050 goals and vision, this policy brief positively builds on the actions being taken in support of the GBF with the aim to provide guidance to play the long game for nature in implementing the 2030 targets.

CBD global review mechanism: ambition and implementation cycle

The GBF review mechanism holds countries accountable for their promises and actions and aims to create an ambition and implementation cycle (see Figure 1.1) in which Parties, based on the analysis of global progress, take responsibility for stepping up their efforts where needed (GBF section J; Decision 15/6; Landry et al. 2026). In deciding which actions to take, it is important for Parties to understand what efforts could bring the realization of the 2050 goals into reach and how biodiversity policies for the long term could be shaped. Unfortunately, these questions have only received limited attention in the CBD Global Report (Affinito et al. 2026). Yet, a growing number of assessments and analyses by a variety of actors complements Parties’ national reports and the Global Report. These provide alternative or complementary lenses on progress towards the 2030 targets, and identify practical barriers, enabling conditions and opportunities to improve implementation (e.g. Campaign for Nature 2026; Ellen Macarthur Foundation 2026; FAO 2026; Finance for Biodiversity Foundation 2026; Forest Peoples Programme 2026; Immerzeel et al. 2026; WWF 2026). Collectively, these sources point to the scale and width of the ambition and implementation gap, and to a broader question for COP17 and beyond: how can the Global Review be used, not simply to take stock of progress, but also to help orient near-term acceleration of implementation towards the longer-term changes needed to achieve the GBF’s 2050 goals? Ultimately, the ambition and implementation cycle should not just affect biodiversity policy, understood narrowly as conservation and restoration, but also address the broader set of underlying causes of biodiversity loss and promote alternative societal imaginations and transition pathways to put nature on a path to recovery (IPBES 2024; Hajer & Oomen 2025).

Figure 1.1

Ambition and Implementation Cycle for the Convention on Biological Diversity (CBD)



Source: PBL

The need to play the long game

As putting nature on a path to recovery is a long-term process requiring consistent and ambitious policies over longer periods of time, this PBL policy brief aims to strengthening the long-term perspective in the ambition and implementation cycle of the CBD and specifically how the Global Review mechanism can contribute to that. Choices made in the here and now must also look at the long-term challenges present. Many of the transitions required to achieve the 2050 goals for biodiversity need to unfold in the coming decade and will necessarily be a combination of smaller, short-term wins and systemic, long-term changes (IPBES 2019, 2025; Termeer and Dewulf 2019). Additionally, the policies to achieve this will often need a long time to get traction on international and national policy agendas before being implemented. This is illustrated by the fact that the ambition and implementation of GBF targets are generally most advanced for those targets that already have a history in the earlier CBD targets for the period 2010-2020, the so-called Aichi Targets (CBD 2026; Immerzeel et al. 2026). At the same time, most governance mechanisms continue to operate within relatively short political and planning cycles, making long-term policy challenging to countries. However, failing to take the long-term challenges into account when deciding on short term policies, will shift problems to future generations and likely increase the costs to tackle the problem in question (Hale 2024; Verwoerd et al. 2026). To contribute to strengthening the long-term perspective in the global review, this policy brief combines governance and scenario analyses. As such, it brings together and builds on various analyses carried out in the last three years at PBL and partner institutes (see Appendix 1 for an overview of publications and methods behind the analyses presented).

Methods

To analyse how far current global and national ambitions bring the world towards meeting the 2050 Goals A (Protect and Restore) and B (Prosper with Nature) and what additional efforts are needed to meet them, we employ a model-based policy scenario-analysis (Kok et al. 2024; Kok et al. in prep) (Chapter 2). To achieve this, we implement the global ambitions in the GBF as well as

the collective ambition in National Targets in scenarios, that we analyse with the PBL IMAGE-GLOBIO integrated assessment modelling framework (Stehfest et al. 2014; Schipper et al. 2020). Subsequently (Chapter 3), we link the scenario analyses to our policy analysis of current ambitions and efforts of Parties and non-state actors in achieving the GBF goals and targets (Immerzeel et al. 2026; Negacz et al. 2026; Lehmann et al. 2026; Kolloffon Rosas et al. in prep.).

Directions for strengthening long-term biodiversity policy

Combining the different parts of the analysis, we suggest three directions for strengthening biodiversity governance from a long-term perspective. First, we identify, from a long-term perspective, directions to accelerate implementation through whole-of-government approaches. For that, we compare scenarios and the derived long-term pathways to restore nature and realise the 2050 goals with the current ambitions and implementation of Parties across GBF targets (CBD 2026; Immerzeel et al. 2026). Second, we suggest directions in building productive linkages between non-state actors and governments in order to realise pathways towards meeting the 2050 goals. We do so by recognising the challenges the CBD is facing in including actors other than states in developing a meaningful whole-of-society approach. We show the landscape of international collaborative initiatives for biodiversity and their contributions to biodiversity governance, actions largely unaccounted for in the CBD Global Report (Negacz et al. 2026). Third, we argue, by emphasising that the CBD at this stage only addresses collective progress, that national responsibility could be explored more explicitly. For that it will be necessary for the CBD to reflect on how to differentiate national contributions to effectively and efficiently implement the GBF in a just way (Lehmann et al. 2026). We show to what extent these topics are currently acknowledged by Parties in National Biodiversity Strategies and Actions Plans (NBSAPs) and National Targets (Kolloffon Rosas et al. in prep.; Oates and Minderhoud 2026). To conclude the policy brief (Chapter 4), we reflect, by building on Landry et al. (2026), on how the results of this analysis can be taken up in the global review process. This includes both the acceleration of implementation that is under negotiation at COP-17, as well as the emerging deliberations on the post-2030 framework for the CBD and the review as a mechanism to strengthen the effectiveness of the CBD after 2030.

2 Assessment of policy actions in the implementation of the GBF

To assess whether the collective ambitions of the Parties for 2030 will bring the 2050 GBF goals within reach, it is first necessary to understand the long-term outcomes of those ambitions for biodiversity and society. So far, such information is lacking, and therefore it remains unclear what additional efforts may be needed towards 2030 and beyond to meet the 2050 goals. In this chapter, we first provide a scenario framework for prospective (*ex-ante*) policy evaluation to understand how different type of scenarios in the context of the GBF can provide relevant information to support the global review (2.1). Following this scenario framework, the chapter then presents specific scenarios (2.2), relevant results of which for the global review process we will discuss (2.3). We then apply the IMAGE-GLOBIO integrated assessment modelling framework to show how much we may ‘bend the curve’ with current ambitions by Parties and from fully implementing the GBF, and what additional efforts may be needed to meet the 2050 goals on top of implementing the GBF.

2.1 Scenario framework for prospective policy evaluation

This section aims to clarify how different types of model-based scenarios can help understand short- and long-term implications of ambition and implementation of the GBF. This is intended as a general approach that can be used for policy evaluation scenarios to enhance comparability of results from multiple model groups to enhance relevance for policy making.

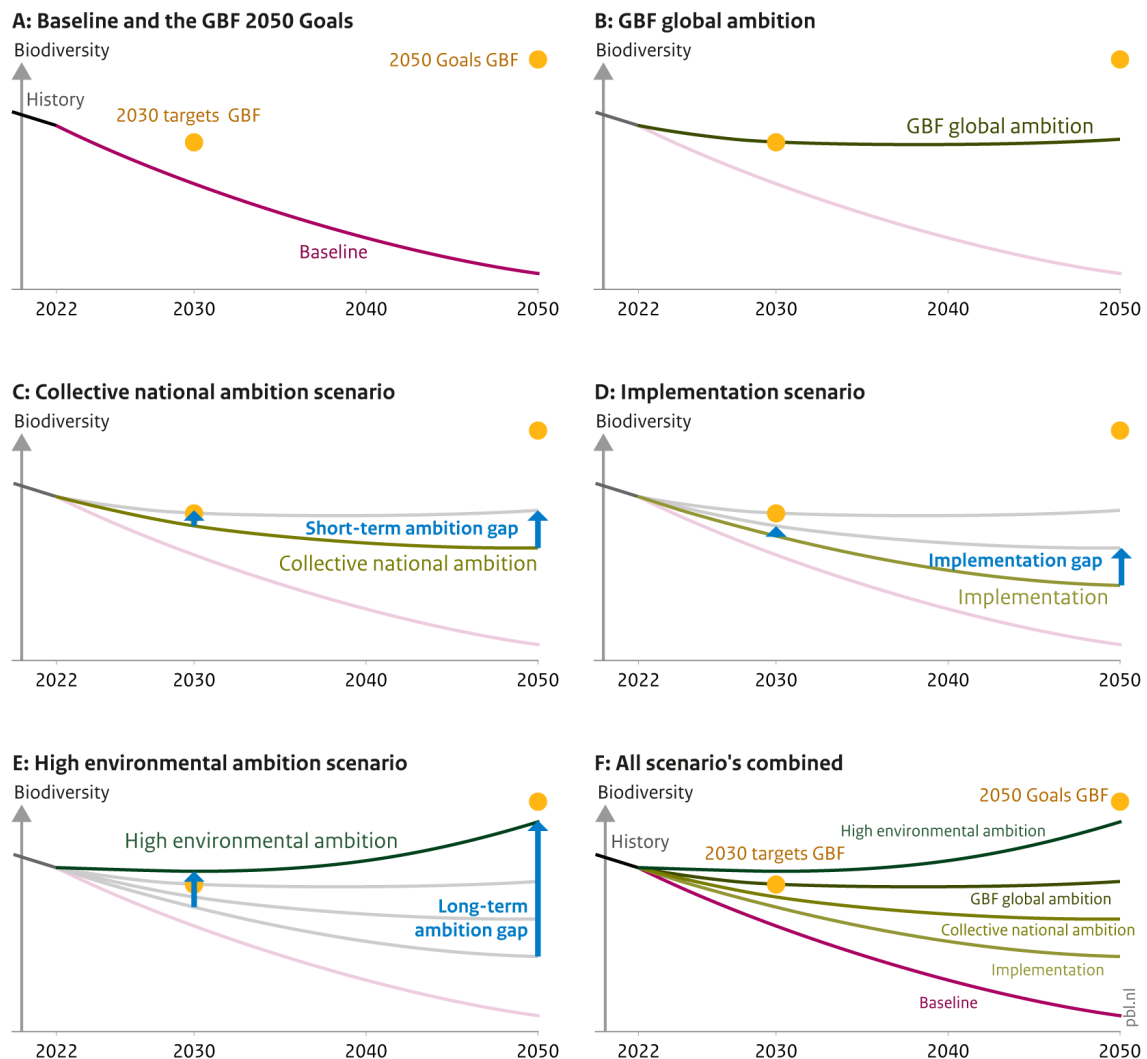
To start, it is important to understand how the GBF action targets for 2030 are related to its 2050 goals. In summary, the short-term actions in realising the GBF targets for 2030 are stepping stones towards achieving the 2050 goals. The desired outcome of the 2030 targets is a certain improvement in the state of nature by 2050 compared to a baseline scenario. A business-as-usual scenario is used as baseline scenario here, to show what happens to biodiversity with a continuation of current trends and already implemented policies. Comparing this scenario to the 2030 and 2050 goals and targets indicates what is considered the ‘policy challenge’ (Figure 2.1A); in other words, where work might be needed. Prospective (policy evaluation) scenario analyses describe the ambitions or to-be-implemented policies by Parties as the ‘policy intervention’. These policy interventions scenarios are analysed to identify the biodiversity outcomes in the future and compared to the baseline scenario. As such, this comparison provides insights into how policy interventions lead to outcomes different from the baseline scenario.

To evaluate how far ambitions of Parties will bring us towards realising the GBF’s 2050 goals, scenarios can be developed in at least two different ways within the CBD context. An ambition scenario can be based on the GBF itself, i.e. the global ambition as stated in the GBF and agreed upon by all 196 Parties (Figure 2.1B). Such a scenario provides insight into the outcomes of the successful, global implementation of the GBF’s 2030 targets towards its long-term goal, as compared to the baseline scenario. It can also be based on the collective ambition in the National Targets, which have already been submitted by parties to the CBD (Figure 2.1C). Our ambition scenario shows how country-level ambitions (i.e. achievement of National Targets) contribute to

achieving the targets and goals. Comparing these ambition scenarios with the baseline scenario indicates a short-term ambition gap in national target setting in relation to the realisation of the GBF 2030 targets, as well as the long-term consequences of those gaps. These scenarios can be complemented with ambitions of Parties in other domains, such as National Determined Contributions (NDCs) for climate or national restoration plans under the United Nations Convention to Combat Desertification (UNCCD) (see Kok et al. 2024).

Figure 2.1

Scenario framework for prospective policy evaluation of the Global Biodiversity Framework (GBF)



Source: PBL

Since ambition does not equal implementation, it is also important to analyse what the effects will be of implemented policies and actions for realising the national targets. This is done with implementation scenarios (Figure 2.1D). A collective implementation scenario of the GBF can be based on National Reports of Parties and complemented with additional reports of relevant national actions, for example for climate or restoration. Comparing the implementation scenario

with an ambition scenario can potentially indicate a possible implementation gap, if implemented policies are not enough to realise the 2030 targets¹.

The scenarios mentioned above can all be characterised as policy evaluation scenarios, either evaluating the long-term impacts of specific ambitions or implementation. To better understand how to meet specific goals as closely as possible, target-seeking or solution-oriented scenarios can be applied. In the case of the GBF, such a scenario would show the efforts needed to bend the curve for biodiversity loss and meet the GBF 2050 goals (Figure 2.1E; here the IPBES Nature Futures Framework (NFF) could be applied to embrace a plurality of perspectives on desirable futures for nature and people in scenarios towards 2050 (Duran et al. 2023). This type of scenario is challenged by the fact that not all 2050 goals provide specific outcome values. Comparing a high environmental ambition scenario with a collective ambition scenario can identify a potential long-term ambition gap. These types of scenarios are especially relevant as orientation points for developing policies to meet the 2030 targets in a long-term perspective and to inform the post-2030 strategic frameworks of the CBD.

2.2 Description of scenarios

Building on the framework presented in section 2.1, we formulated six scenarios to prospectively evaluate the realisation of GBF Goals A and B. We specifically analysed targets 1 (spatial planning and management), 2 (restoration), 3 (protected areas and OECMs), 7 (pollution reduction), 8 (climate change), 10 (specifically on the elements of agriculture and forestry), 11 (Nature's Contributions to People), and 16 (sustainable consumption). A range of policy measures are included in the scenarios. These measures include nature conservation through protected areas, restoration of nature and agricultural lands and peatlands, afforestation on previously degraded lands, water management for irrigation, agricultural residue management, forest management including reduced impact logging, pollution prevention, food waste reductions, and dietary change. As the management of wild species, invasive alien species, the benefits of genetic resources, and urban planning are not included in the models used in this study, not all action targets directly related to Goal A and B could be included. Goals C and D and their related action targets are also not included in the analysis due to model limitations. It is therefore assumed that the necessary finance, knowledge, tools, and instruments to realise the targets in the scenarios will become available (Goal C and D and related targets). We analyse the following 6 scenarios (see Annex 2 for an overview of assumptions):

The *Baseline* scenario (BASE) represents a business-as-usual in which historical trends continue without strong divergences. It builds on the Shared Socio-economic Pathway 2 scenario (Riahi et al. 2018, van Vuuren et al. 2021). Biodiversity and climate policies that are already implemented in national legislation are included, but no additional effort is assumed. Details of this scenario are described in Kok et al. (2024).

¹ In this report we do not address implementation scenarios, as National Reports have only become available after February 1, 2026, leaving too little time to convert these reports into a scenario analysis. This will be a next step in our research.

The *National Targets scenario* (NT) is based on the National Targets submitted by Parties to the CBD for the eight GBF global action targets mentioned above. These targets are derived from the CBD's Online Reporting Tool (ORT) and include all quantitative national targets submitted by 161 Parties by April 1, 2026. Only quantitative national targets as submitted by Parties were assessed to be included in the scenario (577 out of the 1934 national targets that Parties aligned to the GBF targets). Policy measures from 141 individual Parties are included in the scenarios. These are dominated by conservation and restoration measures (145 and 112 individual targets, respectively, with some overlap as some targets explicitly target restoration and conservation jointly). National Targets from individual European Union countries were implemented at country level, when specified quantitatively. We identified additional targets for pollution (31) and waste management (20), but these are not yet implemented in the scenario. For climate change, the 2026 NDCs are included in the scenario (Hooijschuur et al. 2026), as National Targets aligned to GBF target 8 often either refer to NDC targets or to targets also taken up under GBF target 2 on restoration.

The *National Targets Optimistic scenario* (NTO) is also based on the National Targets submitted by Parties to the CBD, similarly to NT, but implements qualitative national targets in addition to quantitative national targets to recognise the positive intent by Parties through qualitative targets. This is done by assuming regional averages of the countries that did submit quantified targets. We made this generalisation if at least 50% (area weighted) of the countries in a world region had provided quantitative or qualitative targets on the GBF target analysed (while at least 40% of the world region area should be covered by quantitative targets). In Africa, the Americas, Asia, and the Pacific, quantitative targets cover more than 50% of the region's area. In those regions, area-weighted averages of restoration targets are applied to all CBD Parties without a quantitative target. These averages are added to the quantitative targets from the NT scenario. The minimum threshold of 40% area covered by quantitative targets is not met in the European and Central Asia regions. Therefore, in the NTO scenario, the same NT quantitative targets are implemented, with the exception that the EU quantitative target (i.e. restoring 20% of degraded lands by 2030) is applied in European countries when individual countries did not provide a quantitative target.

By combining the NT and NTO scenarios, we provide a bandwidth in the analysis of national targets and address some of the challenges in interpreting the National Targets. More details of the NT and NTO scenarios will be described in Kok et al. (forthcoming).

The *Global Biodiversity Framework* (GBF) scenario is based on an assumed full, global implementation of the eight GBF global action targets named above, independent of the National Targets submitted by Parties to the CBD. We follow the target guidance provided by CBD (www.cbd.int/gbf/targets) to the extent possible. Since many of the action targets are broadly formulated and lack specificity or quantification, further assumptions had to be made, and not all target elements could be included in the scenario-analysis.

The *Global Biodiversity Framework and Current Climate Commitments* (GBF+NDC) scenario complements the GBF scenario current climate commitments under the United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement in the 2026 National Determined Contributions (NDCs; Hooijschuur et al. 2026). This allows for the evaluation of synergies and trade-offs between biodiversity and climate mitigation policies and also shows the benefits of current climate commitments for biodiversity outcomes.

By combining the GBF and GBF+NDC scenarios, we provide a bandwidth in the interpretation of a fully implemented GBF with and without climate commitments under the UNFCCC. Details of these two scenarios are described in Kok et al. (2024).

In the *High Environmental Ambition scenario* (HEA), the GBF scenario is further complemented with policies geared towards high environmental sustainability ambitions and transformative change to meet the CBD 2050 goals and the Paris Agreement under UNFCCC. The HEA scenario includes additional efforts that will be needed beyond the targets of the GBF to realise the 2050 goals, including the Paris agreement to stay well below 2 ° Celsius, as well as other environmental objectives to stay within planetary boundaries. This scenario includes additional measures for conservation and restoration, changes in food- and agricultural systems, as well as energy systems, dietary changes, and other demand-side measures. Details of this scenario are described in Kok et al. (2024).

For the scenario analysis, we apply PBL's integrated assessment modelling framework IMAGE (Stehfest et al. 2014) in combination with the global biodiversity model GLOBIO (Schipper et al. 2019). The GLOBIO-IMAGE framework has previously been used to explore alternative futures for biodiversity and policy pathways towards the realisation of biodiversity targets (CBD Secretariat 2014, 2020; IPBES 2019; 2025; Kok et al. 2023; Leclère et al. 2020, Pereira et al. 2024; GLOBIO and IMAGE are also described in Alkemade et al., 2009; Janse et al., 2015; Kok et al., 2023; Schipper et al., 2019; Stehfest et al., 2014; www.globio.info; www.pbl.nl/en/image/about-image). In our scenarios, we assess the period from 2020 to 2100. We focus on 2050, which corresponds to the deadline to achieve the GBF goals, and go beyond 2050 to 2070 and 2100 for temperature increase because climate change dynamics take decades to materialise.

2.3 Scenario results on long-term outcomes of GBF implementation

The results from applying the scenarios to the IMAGE-GLOBIO framework show that implementing the national targets leads to significant increases in natural area (biomes such as tundra, peatlands, and non-managed and managed forests) and biodiversity compared to the baseline scenario. In NT, natural land increases by 209 Mha between 2025 and 2050 (a 2.2% increase, an area similar to the size of Saudi-Arabia) compared to a 134 Mha (1.6%) decrease in the baseline (Figure 2.2 and 2.3a). This is predominantly driven by the expansion of protected areas which limits agricultural land-use change, and the implementation of restoration efforts, which we partly interpret as full ecological restoration of natural area and partly as rehabilitation of agricultural land (changes in land management that enhance ecosystem services and biodiversity value and make agricultural practices more sustainable, for example through agroforestry, conservation agriculture or erosion prevention measures). In the NTO scenario, the addition of qualitative targets, as based on average regional quantitative targets, leads to a relatively larger increase in natural land of 325 Mha (a 4% increase, an area similar to the size of India). Nevertheless, the increase in natural land is substantially higher in the GBF scenario, which shows natural land increases of 580 Mha from 2025 to 2050 (7.2%), due to full implementation of GBF action targets, including 30% protected area and 30% restoration as well as reduced consumption footprints. Implementing the Nationally Determined Contributions for climate change mitigation in the GBF+NDC scenario in turn leads to a slightly lower increase in natural land compared to GBF of 480 Mha (5.9% increase). This is caused by the substantial role of bio-energy in achieving the climate mitigation goals which leads to

relatively higher agricultural land use and therefore less natural land area. Lastly, the HEA scenario projects the largest increase in natural area, an increase of 1180 Mha (15%) from 2025 to 2050, due to a further increase in protected areas and restoration of 50% in 2050 as well as full adoption of healthy diets.

The changes in natural land are distributed differently across the world (Figure 2.2). In the BASE scenario, natural land is mostly lost in Sub-Saharan Africa and Latin America. Modest increases in natural land due to agricultural abandonment occur in Europe and North America. Current climate change mitigation actions aimed at reducing deforestation and fostering afforestation also result in increases in India, China and Indonesia due to policies. In the NT scenario, losses are significantly reduced in Latin America and Sub-Saharan Africa, and expansion of natural land area due to restoration takes place in Europe and Asia. In Sub-Saharan Africa, significant losses in natural land occur after 2030 due to continued population growth leading to agricultural land expansion. The NTO scenario is fairly similar, with additional natural land expansion notably in Central Europe, Australia and various Sub-Saharan Africa countries. In the GBF and GBF+NDC scenarios, the full implementation of the GBF results in improvements in natural land across all world regions, with notably extra natural land in Northern America. Finally, the HEA scenario results in higher natural land areas across all world regions and also prevents most of the additional natural land loss in Sub-Saharan Africa in the NT and GBF scenarios after 2030 due to a stepping up of the efforts in the 2030-2050 period.

The increase in natural land in the NT and NTO scenarios results in relative improvements in biodiversity, with MSA (Mean Species Abundance) increasing by 1 percentage point in 2050 (from 0.61 to 0.62; Figure 2.3b). The largest gain is achieved between 2025 to 2030, when the conservation and restoration efforts are implemented, which leads to a temporary improvement in global average intactness of biodiversity. From 2030 onwards however, biodiversity is projected to decline again as climate change impacts continue to increase. The GBF scenario performs slightly better, most notably by the end of the century, but still does not achieve a bending of the curve of biodiversity loss towards achieving the 2050 Goals. The GBF+NDC scenario performs even slightly worse than the GBF scenario as the loss of biodiversity due to more extensive bioenergy use is not outweighed by the benefits of lower climate change impacts. This highlights the risk that negative effects of climate policy may be worse than the benefits of reduced temperature change. Only the HEA scenario achieves a clear bending of the curve of biodiversity loss as a result of large-scale nature protection and restoration and a full transition of the food and energy systems including achieving strict climate change mitigation targets of 1.5 °C.

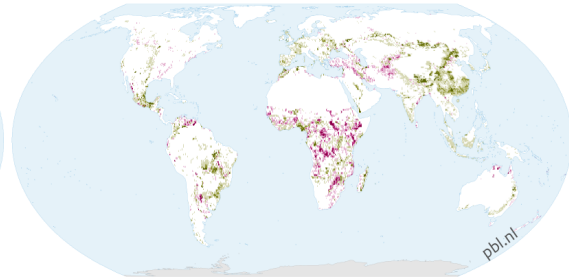
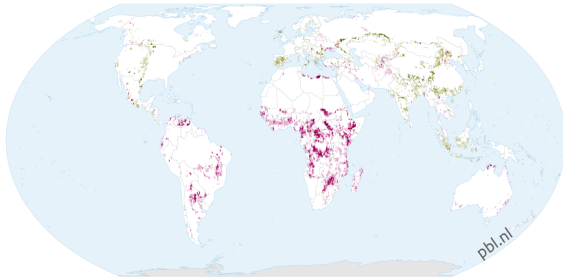
The climate change benefits of implementing the national targets are modest but non-negligible with about 0.1 °C temperature benefit by the end of the century (Figure 2.3c). This is a result of reduced conversion of natural land and nature restoration which includes tree planting and peatland restoration. All these efforts prevent CO₂ emissions and enhance the natural carbon sink leading to a reduction of CO₂ in the atmosphere compared to baseline levels. In the GBF scenario the larger scale of conservation and restoration leads to a 0.2 °C reduction in global average temperatures. In the GBF+NDC and HEA scenarios the temperature reductions compared to the baseline are substantially larger with 0.5 °C and 1.5 °C, respectively. This illustrates that nature-based solutions can help to limit climate change, but without full decarbonisation of the energy system the goals of the Paris agreement cannot be achieved. This is equally important for the goals of the GBF, as bending the curve of biodiversity loss can only be achieved when temperature change is limited to well-below 2°C.

Figure 2.2

Natural area change for six scenarios, 2025 – 2050

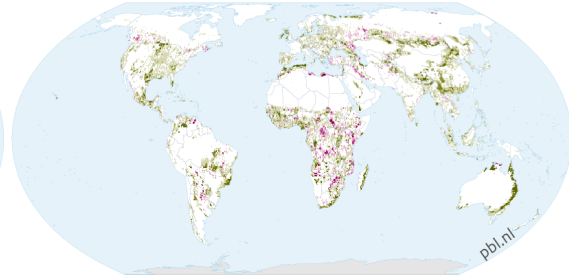
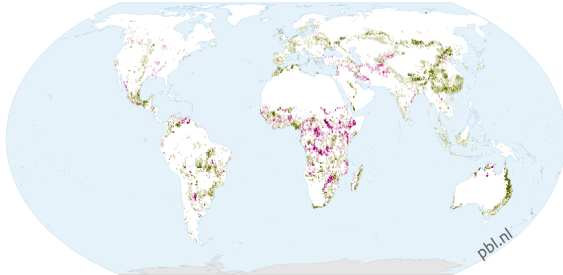
Baseline: – 1.1 million km²

National Targets: + 2.1 million km²



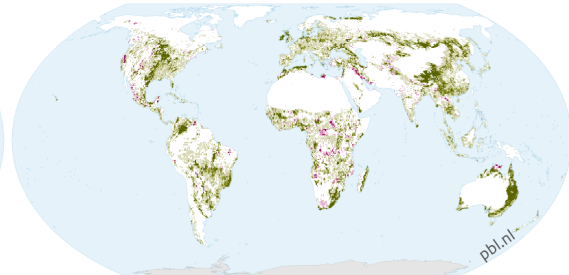
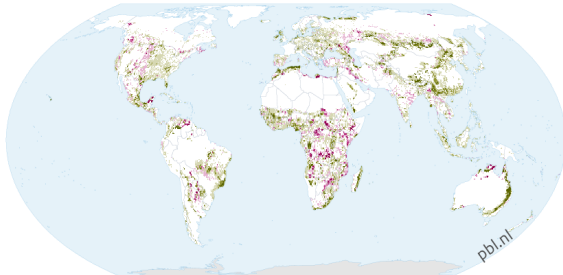
National Targets Optimistic: + 3.3 million km²

Global Biodiversity Framework: + 5.8 million km²



Global Biodiversity Framework + National
Determined Contributions: + 4.8 million km²

High Environmental Ambition: + 11.8 million km²



Deforestation and conversion
of natural land
(% change per grid cell)

5 30 50 100

Abandonment of agriculture
to natural land
(% change per grid cell)

5 30 50 100

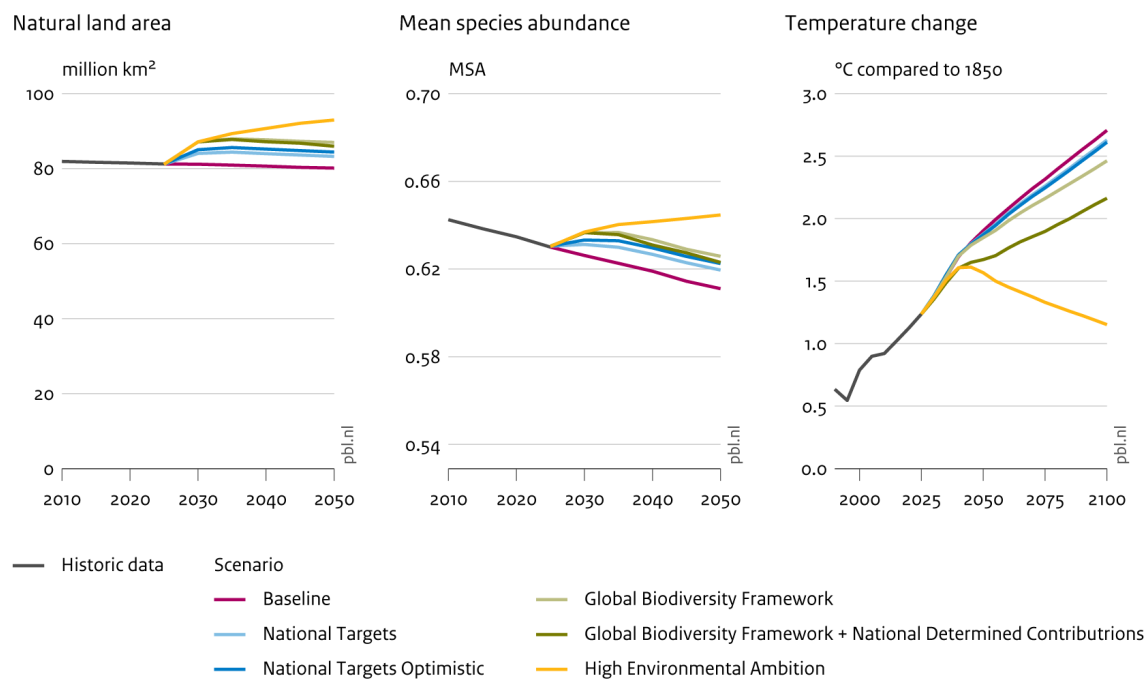
□ No or small change
(less than 5%)

■ No data

Source: PBL IMAGE GLOBIO

Natural area are biomes such as tundra, peatlands,
and non-managed as well as managed forests.

Figure 2.3
Global trends in state of biodiversity and temperature



Natural area are biomes such as tundra, peatlands, and non-managed as well as managed forests.

Source: PBL IMAGE GLOBIO

2.4 Conclusions for the Global Review

In the baseline, biodiversity will further deteriorate with increasing risks for people and economy and rising costs of inaction as a consequence. Implementation of the National Targets (NT, NTO) results in a significant improvement in natural area and biodiversity compared to the baseline. At the same time, collective ambitions in National Targets do not (yet) match the ambitions of the 2030 GBF targets. So even if National Targets are fully realised, our analysis (comparing NT and NTO with GBF) shows that part of the promises of the GBF will be left unfulfilled. This indicates a short-term ambition gap for Parties. Implementing the global ambitions of the GBF (GBF, GBF+NDC) show a further improvement compared to the National Targets scenarios. However, comparing GBF and GBF+NDC also shows a possible trade-off between biodiversity and climate policies, emphasizing the need for further improving policy coherence in implementation of biodiversity and climate commitments by Parties. This is necessary, as it is clear that bending the curve of biodiversity loss can only be achieved when temperature change is limited to well-below 2°C. Meeting the CBD 2050 goals and bending the curve for biodiversity will require a stepping up in ambition and implementation beyond the 2030 GBF targets (comparing HEA and GBF indicates the long-term ambition gap). This finding is also confirmed by Maney et al. (2026), who analyse progress towards the achievement of the 2050 Goals A and B with scenarios across a range of value perspectives on nature linked to the IPBES Nature Futures Framework. To achieve this bending the curve for biodiversity while also meeting the well-below two degrees target of the Paris agreement, requires a broad portfolio of options, including large-scale nature protection and restoration and a full transition of the agriculture-food and energy systems, changes towards plant-based diets and addressing the global footprint of consumption and production.

3 Strengthening long-term biodiversity governance

The scenario analysis in Chapter 2 showed a short-term and long-term ambition gap, while the CBD Global Report also concludes that it is necessary to accelerate implementation to meet the 2030 targets and that not meeting the 2030 targets will put realising the 2050 goals at risk. This chapter therefore suggests three ways forward in identifying policies and actions to accelerate implementation of the GBF in ways that contribute to meeting the 2050 goals, building on the whole-of-government and whole-of-society approach being adopted in the GBF. Comparing the scenarios analysed with analysis of ambition, scope, and comprehensiveness of National Targets, we first consider directions for whole-of-government approaches to meet the 2050 goals (3.1). Subsequently, we suggest ways forward for Parties to amplify the contribution of non-state actors in realising transition pathways (3.2). Lastly, we argue that to be able to accelerate GBF implementation, there is a need to go beyond evaluating collective progress, as the distribution of responsibilities among Parties needs to be addressed in stepping up efforts towards the 2050 goals in an effective and fair way (3.3).

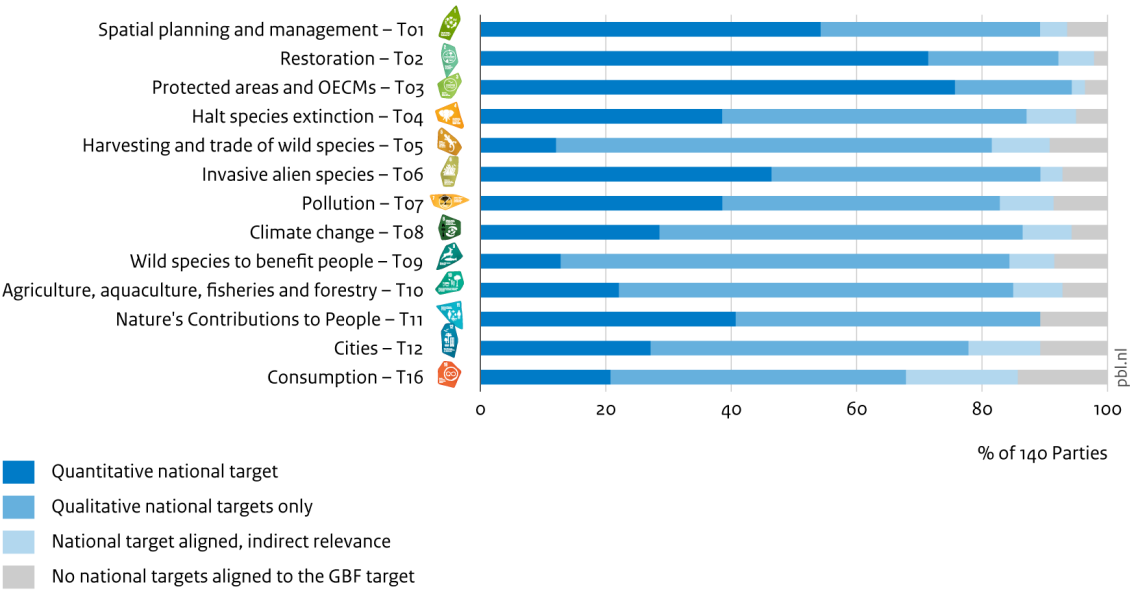
3.1 Whole-of-government approaches to achieve 2050 goals

To effectively realise its goals and targets, the GBF adopted a whole-of-government approach. Such a government-wide approach is especially necessary, both on the national and international level, to address direct and indirect drivers of biodiversity loss and to include nature in all relevant policy domains and make nature an integral part of long-term sustainability transition pathways. The biggest gains for biodiversity in the High Environmental Ambition scenario (compared to the other scenarios presented in section 2), next to more ambitious conservation and restoration than the GBF currently calls for, come from addressing the direct and indirect drivers of biodiversity loss. This scenario reveals, in line with other target-seeking scenarios (e.g. Leclère et al. 2020; Leadley et al. 2022; Kok et al. 2023; Maney et al. 2026, Obura et al. 2023; van Vuuren et al. 2025), a portfolio of options that all need to be employed to meet multiple long-term biodiversity, climate, environmental, and development goals. In particular, this scenario shows that achieving a sustainable agri-food system, net-zero emissions in a nature-inclusive manner, and more broadly a reduction of our footprint of consumption and production, including a change towards a more plant-based diet, will all be necessary to keep long-term biodiversity goals within reach. Realising this will require transition pathways in multiple policy domains that all have to contribute to positive outcomes for nature.

However, our analysis of ambition and implementation of National Targets directly related to Goals A and B (Immerzeel et al. 2026) shows that direct and indirect drivers of biodiversity loss are not yet sufficiently addressed. Direct drivers of biodiversity loss such as T7 on pollution and T8 on climate change are relatively often quantified, but they are usually not further specified to the national context. Targets addressing indirect drivers of biodiversity loss receive the least attention (T10 Agriculture, aquaculture, fisheries, and forestry, T12 Cities, and T16 Consumption) (Figure 3.1). Parties most concretely focus on T2 and T3 on (area-based) Conservation and Restoration, followed

by the Species targets (T4, 5, 6, and 9), and T11 on Nature’s Contributions to People (NCPs). Moreover, within the scope of national targets and their implementation, most attention is directed towards ecological target elements rather than to human aspects, for instance on nature’s benefits for people, or on respecting the rights of people and ensuring equitable forms of governance.

Figure 3.1
National target response under GBF targets directly relevant to GBF Goals A and B

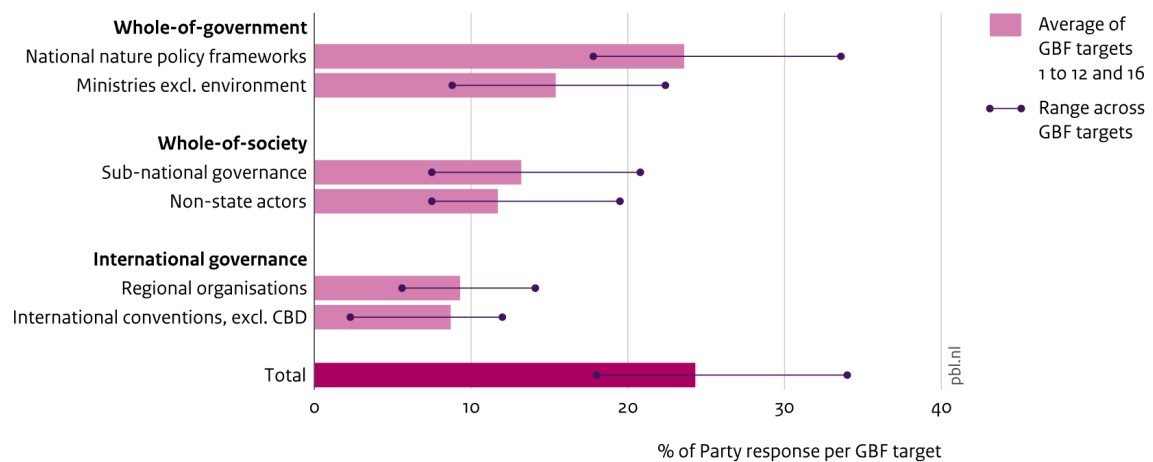


Source: CBD ORT, 1 december 2025

In addition, we find that National Targets are generally not reflecting whole-of-government and whole-of-society considerations. On average, in the 13 GBF targets analysed, 24% of Parties describe such considerations in their national targets, ranging from 18% to 34% (Immerzeel et al. 2026; Figure 3.2). Throughout the GBF targets analysed, patterns generally look the same; the majority of Parties that do include whole-of-government and whole-of-society considerations describe linkages between National Targets and national policy frameworks on nature or the environment. But realising the transition pathways that address the drivers of biodiversity loss requires involving other parts of government than that of nature, as well as connecting national efforts to international governance. Sub-national governments and ministries, such as on agriculture, forestry, finance, or infrastructure, are mentioned to a lower extent by Parties, while non-state actors, regional cooperation, and international conventions outside the CBD are mentioned even less.

Figure 3.2

Whole-of-government and whole-of-society approaches in national targets aligned with GBF targets analysed



Bron: CBD ORT, 1 december 2025

The GBF explicitly intends to guide the necessary transitions for biodiversity to meet its long-term goals. While we find that Parties do make linkages between different GBF targets, and specific clusters of targets do emerge, clustering around transition pathways is not evident. Text box 3.1 provides an illustration of how different GBF targets relate to each other for the transition towards nature-friendly and sustainable agriculture and food systems, and analyses to what extent Parties describe these connections in their National Targets.

Text box 3.1: Transition towards nature-friendly and sustainable agriculture and food systems

Worldwide, agricultural, and food systems highly impact biodiversity and are dependent on healthy ecosystems. To systematically work on reducing pressures on biodiversity and benefit from nature's contributions to people, it is therefore crucial to transform our agricultural and food systems (FAO 2019; SCBD 2020).

Several GBF targets are relevant for this transition. GBF target 10 specifically addresses agriculture and requires Parties to manage areas under agriculture more sustainably, which is also mentioned by 88% of Parties who have submitted National Targets in alignment with target 10. Usually, approaches on how to reach these targets are not specified by countries, but in the cases they do, most attention goes to agroecological and nature-inclusive approaches as an alternative to improvements in the dominant, often highly intensive, agricultural system.

The GBF also contains many other targets that are directly and indirectly relevant to agriculture and food systems. For example, GBF target 7 aims to tackle pollution, explicitly referring to pesticides and hazardous chemicals, nutrients, and fertilisers. These target elements are included by 60% and 51% of Parties, respectively, in their national targets. GBF target 11 on Nature's Contributions to People (NCPs) is explicitly linked to NCPs in agricultural areas by one-fifth of the Parties that have submitted National Targets in alignment with this GBF target. Additionally, 32% of Parties specifically refers to soil health as an NCP, 30% refers to water regulation, and 22% refers to pollination. Under GBF target 1, 14% of Parties address agriculture as a cause of land-use change and a quarter of the countries refers to the agricultural sector. Additionally, although GBF target 16 focuses on sustainable consumption, 11% of the Parties with national targets aligned to GBF target 16 has also included a target on reducing food waste at the production level. The reduction of harmful incentives (target 18), which is an important target in relation to agricultural subsidies, is referred to by 20% of Parties under GBF target 10.

The examples in Text box 3.1 show that Parties do apply relevant GBF targets to focus their policies on agriculture and food systems and can serve as an example of how the GBF can further guide a specific transition pathway. However, the majority of Parties do not (yet) make explicit linkages between the target on agriculture and relevant elements of agriculture and food systems under other GBF targets. A clear articulation of transition pathways is necessary within the CBD to guide national actions, including through its National Targets. Subsequently, the evaluation of progress in the second Global Review could also be carried out along those lines.

To further strengthen whole-of-government approaches following the analysis above, we provide the following directions and suggestions:

- Operationalise mainstreaming through the lens of transformative change and prioritise transition pathways that address direct and indirect drivers of biodiversity.
- Engage with those economic sectors, development priorities, and policy decisions outside the traditional remit of environmental institutions.
- Strengthen the capacity of the CBD framework, mechanisms, and the Global Review to show progress and inform action across the broader governance architecture relevant to nature. This includes through specifying the currently not-so-SMART targets in order to increase measurability in national efforts and collective progress.

- Establish/make use of platforms that enhance learning amongst countries in target implementation, especially building on the already existing examples of connections that are being made in relation to long-term transitions and transformative change perspectives.

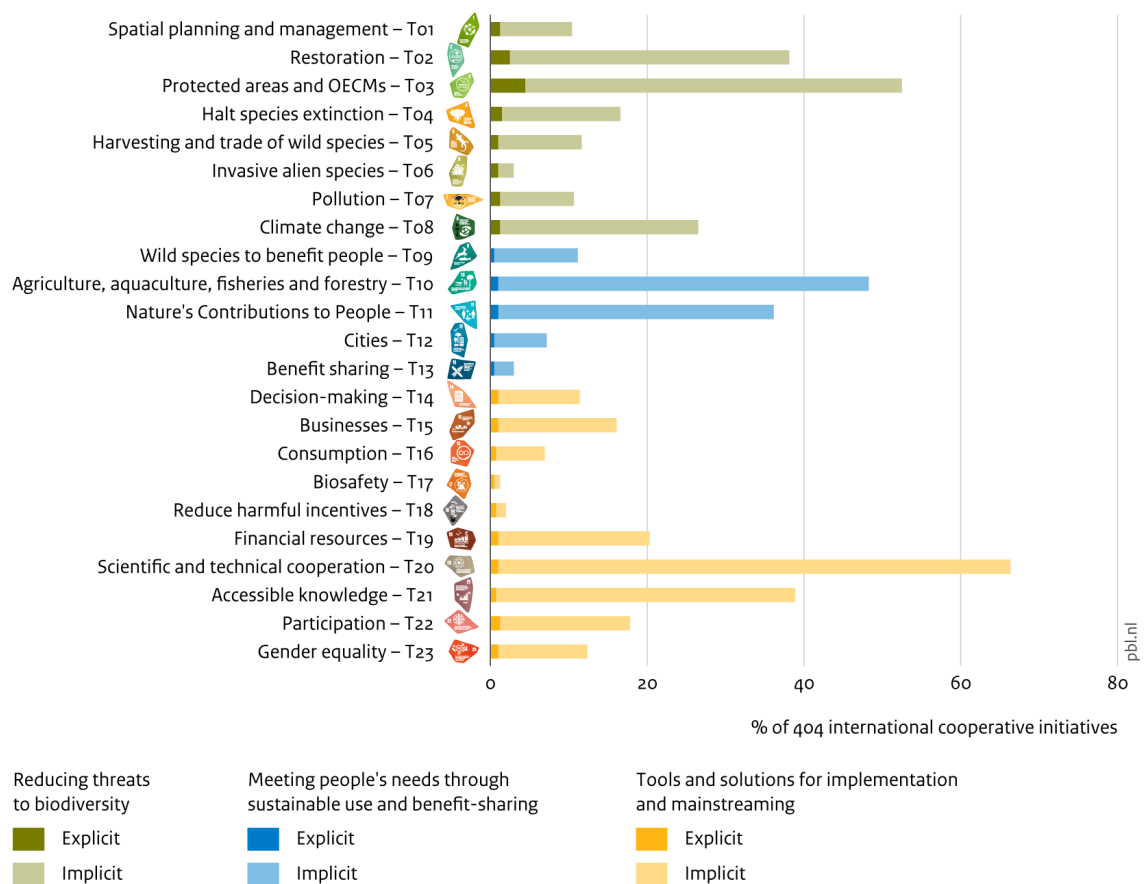
3.2 Leveraging the role of non-state actors in achieving the 2050 goals

The ambition and implementation gap identified in the Global Review is primarily based on the collective ambition of Parties. Currently, it is not sufficiently clear what role non-state actors and whole-of-society approaches do play in achieving the 2050 goals. The CBD and Parties could benefit from harnessing the potentials of an emerging hybrid and plurilateral governance system, with an increasing role played at all levels of decision-making by a variety of non-state actors, including Indigenous peoples and local communities, business, finance, cities and sub-national actors, religious groups, and so forth. This provides an opportunity for the CBD to develop a long-term and proactive approach to leverage the potential of non-state action in realising transition pathways towards the 2050 goals as part of the 'whole-of-society' approach already adopted in the GBF. System-wide transformative change demands engaging actors from all societal sectors to envision and contribute to change collectively (IPBES 2025; Reyes-Garcia et al. 2026). To develop and implement transition pathways, global biodiversity governance can benefit from stronger recognition of the different governance functions and frontrunner role non-state actors can take for biodiversity (Kok et al. 2019; Pattberg et al. 2019). The closer involvement of non-state actors in biodiversity governance would support the mainstreaming of biodiversity in relevant economic sectors (Karlsson-Vinkhuyzen et al. 2018), help to build positive political and societal momentum, foster innovative governance initiatives as 'niches' or 'seeds' for transformative change and further upscaling, and break current gridlocks in negotiations or implementation. Support from non-state and subnational actors for more ambitious action could also enable stronger commitments from governments (Kok and Ludwig 2021).

The landscape of non-state actors engaging with biodiversity transnationally is large and continuously growing. However, in the Global Report (CBD 2026) non-state actions go largely unnoticed (Affinito et al. 2026). The CBD could start harnessing the potential of the many hundreds of international collaborative initiatives (ICIs) that implement the GBF on the ground. Our own analysis finds over 400 such initiatives internationally, bringing together thousands of cities, businesses, and other actors organised under their umbrella, that provide important contributions for nature and people (Negacz et al. 2026).

Figure 3.3

Share of International Cooperative Initiatives addressing GBF targets



Explicit refers to initiatives that mention the GBF target they work on
Implicit refers to initiatives that work on the topic of the specific GBF target, but do not mention the GBF target

Source: Bio* version 4, 2026; analysis VU-IVM and PBL

The number of ICIs has grown steadily, particularly since the mid-2000s, and has shifted over time from being primarily led by public authorities, such as governments and international organisations, to being led by partnerships, including private and civil society entities like private companies and NGOs. This indicates a widening in the type and number of organisations that are willing to voluntarily engage in addressing biodiversity loss by, for instance, scientific and technical cooperation, finance provision, and capacity building. Geographic patterns of the ICIs however, reveal a persistent imbalance. Many initiatives target global or biodiversity-rich regions, while secretariats are disproportionately located in Europe and North America, suggesting ongoing asymmetries in the institutional landscape (Negacz et al. 2026).

Figure 3.3 shows the number of ICIs addressing the various GBF targets. ICIs focus around T1 Restoration and T3 Protected areas and Other effective area-based conservation measures (OECMs); around T10 Sustainable production in relevant sectors and T11 Nature's contributions to people; and on T19 Financial resources, T20 Science and technical cooperation, and T21 Knowledge. T8 Climate change and T15 and 16 Production and consumption pressures are increasingly visible in

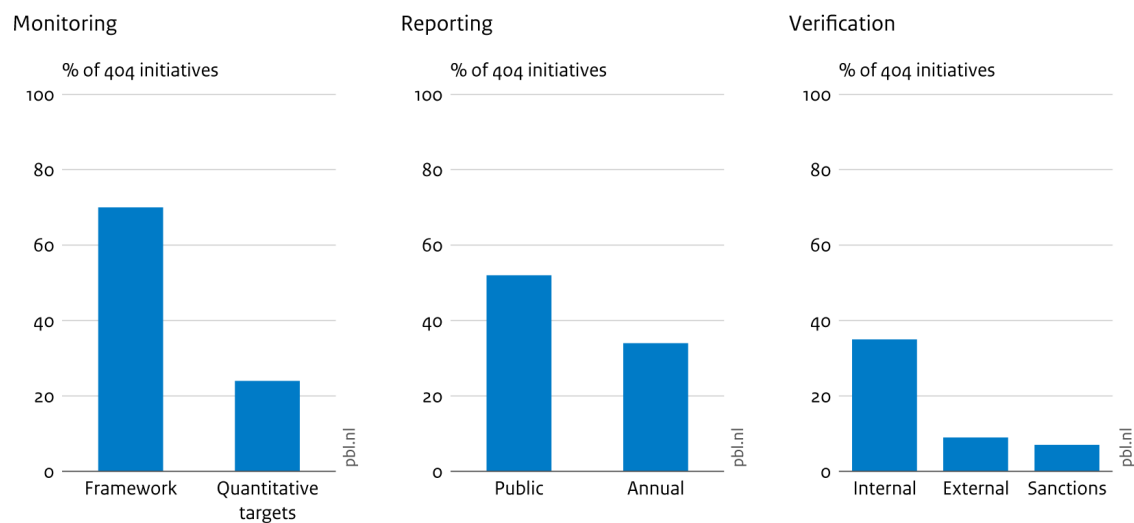
the thematic coverage of the ICIs, pointing to stronger coupling between biodiversity governance and broader sustainability transitions over time.

An earlier attempt to mobilise non-state action in the CBD through the Sharm-el-Sheikh to Kunming Action Agenda (started in 2018), has largely failed to achieve its purpose. It is no longer actively promoted by Parties or the CBD secretariat, has not received any new contributions recently, and no longer plays a visible role in the CBD process. This is a missed opportunity, as it could provide a platform for connecting the CBD with non-state action on biodiversity, including through cooperative initiatives. Additionally, recent efforts in the Global review to highlight the work done by non-state actors appears to fall short of its potential. Non-state actors were asked to submit their commitments and report on progress to the CBD Online Reporting Tool (ORT). This resulted in a situation in which the Global Report only identified a limited number of non-state commitments, despite scientific evidence that the number and type of initiatives and commitments is much higher (e.g. Negacz et al. 2026). In the ICIs analysed in this policy brief, formal engagement with the GBF is limited to a handful of large, established ICIs. The problems to capture commitments by ICIs in support of the Global Review may be explained by a lack of awareness, willingness, or capacity among ICIs to submit information to the Online Reporting Tool. Another reason may be the lack of incentives to do so and that ORT submissions are country-based, while the analysed initiatives are international (partnerships), with most operating at the global level. For non-state initiatives at national or sub-national level the barriers to submit commitments to the CBD are likely even higher.

In the context of the Global Review, it is notable that the monitoring, reporting, and verification activities used by the analysed ICIs (see Figure 3.4) offer an opportunity to gain insight into the actual contributions made by non-state actors to the GBF goals and targets, which can inform future global reviews. Figure 3.4 shows that 70% out of 404 international initiatives already have a monitoring framework in place. 24% of them have quantitative targets, and 52% also report on their activities. 35% of the initiatives have internal verification procedures in place and about 9% also have established external verification procedures and sanctions. These are primarily standards such as ecolabels. As one of the challenges for a whole-of-society approach is the risk of greenwashing and allowing unwanted special-interest to influence the intergovernmental process, the credibility of non-state action by enhancing responsibility, transparency, and accountability is crucial. (Widerberg et al. 2021; Chan et al. 2022). Therefore, accountability remains a point of attention for non-state actors. While basic monitoring is relatively widespread, more demanding mechanisms such as quantified targets, regular reporting, external verification, and sanctions, are adopted by far fewer initiatives.

Figure 3.4

Monitoring, Reporting, and Verification in international collaborative initiatives, 2022 – 2026



Source: Bio* version 4, 2026; analysis VU-IVM and PBL; data collection 2022 – 2026

Accordingly, despite the challenges to develop more advanced Monitoring, Reporting, and Verification systems by non-state actors, existing international monitoring and reporting mechanisms demonstrate that there are large amounts of data already available in the public sphere on the biodiversity actions by non-state actors. Future global analysis of non-state actor actions under the GBF would thus have an abundance of monitoring and reporting data to build on. Using these data might provide more relevant information than relying on voluntary submissions to the CBD portal, which are sometimes insufficient to provide any comprehensive insight on commitments and actual contributions to the realisation of goals and targets of the GBF. A key challenge remains to align the existing non-state reporting with the GBF on goals, targets, and indicators. This could be tasked at COP-17 to the CBD Expert group that will advise on the further improvement of the monitoring framework.

Amplifying the role of non-state actors in the direction suggested in this policy brief requires Parties to not only see them as implementors of national policy, but especially as actors that act as frontrunners that are actively shaping and co-creating transition pathways towards the 2050 goals. This requires moving beyond consultation and recognition towards more meaningful partnerships in which different actors can help identify trade-offs and co-design pathways that reflect diverse development aspirations and local realities. It also requires considering how government policies at all levels can support and scale up such activities. We provide the following directions to build more productive linkages between governments and non-state actors:

- Create frontrunner coalitions of non-state actors and countries willing to advance specific pathways beyond what is currently agreed in the GBF, potentially organised around key sectors, drivers of biodiversity loss, or specific pressures on nature. Such partnerships could bring together relevant communities of actors around concrete challenges, enabling them to co-create solutions and pathways for change, and thinking about the enabling conditions to achieve them.

- Revitalise the support and capacity of the Action Agenda as an institutional platform for showcasing non-state actions for biodiversity, while providing opportunities for collaboration around shared thematic priorities.
- Beyond showcasing and reporting, provide a space for connecting initiatives, facilitating dialogue around shared challenges, and feeding lessons from locally- and sectorally grounded initiatives into CBD discussions on longer-term pathways.
- Connect with Action Agendas in other international processes such as the UNFCCC and UNCCD, to identify and benefit from action taken for nature in other policy domains.
- Build on monitoring, reporting, and verification systems and reports, such as the Local Biodiversity Outlook (LBO-3), of different non-state actor groups, to include the contributions of non-state actors in the Global Report. Task the CBD Technical Expert group on the monitoring framework to support alignment between the CBD indicators and non-state monitoring and self-reporting.
- Support collective reporting by for example business, finance, cities, and non-state actors, and recognise these as legitimate and additional sources for the second global review.
- Enable reporting commitments by international partnerships including more than one country to harvest synergies and connections among various actors.

3.3 Differentiating responsibility in biodiversity policy to realise the 2050 goals

While the Global Review assesses collective progress, achieving the 2050 goals in an effective, efficient and just manner will also require addressing contributions and responsibilities across Parties. These responsibilities relate to the contribution Parties make to the GBF through domestic action, the impacts of their production and consumption abroad, and their contribution to international cooperation for biodiversity (including finance). Shifting from collective progress to differentiating individual Parties' contributions for effectively and efficiently achieving the GBF also raises questions of justice. Which Party needs to do what, and why, can be identified based on different distribution principles, given the differences in for example responsibility, capacity, benefits, and needs.

Parties are required to revise their National Biodiversity Strategies and Action Plans (NBSAPs) and/or National Targets based on the Global Review of collective effort towards achieving the GBF. However, there is no clarity yet on how to differentiate national contributions to implement the GBF. National commitments can be lower but also higher in ambition than the GBF's targets, as the GBF is a global framework and it is up to the Parties themselves to decide how and to what extent they contribute to the GBF targets. In stepping up the GBF's collective ambition, it is therefore important to also consider how responsibility is understood and differentiated among Parties in implementing the GBF. Reflection on countries' respective responsibilities for causing biodiversity harm, capacities for mitigating it, and how to share its benefits is relevant from an environmental, economic as well as justice perspective, and can contribute to the legitimacy and success of the GBF. It can help avoid political and public backlash and ensure legitimacy of the CBD's policy and processes (Oates and Verveld 2024). Equitable global biodiversity policy is therefore increasingly being recognised as a critical enabler to successful implementation (Hampton-Smith et al. 2024).

The GBF has placed greater emphasis on justice and equity considerations than the Aichi targets did, taking up such considerations throughout its goals, targets, monitoring framework, and considerations for implementation (Section C of the Framework; Hampton-Smith et al. 2024). An example of justice considerations is the GBF's acknowledgment that countries have different capacities for its implementation (articles 7 and 15). It also refers, for example, to the right to development as a consideration for implementation under Section C, and increasing financial resources from developed countries under GBF target 19 (CBD 2022). However, the GBF does not provide further guidance on what a just distribution of responsibility across countries for domestic biodiversity action looks like, or what reducing the external impacts of consumption and production or providing means of implementation can look like. Generally speaking, clarity on the conceptualisation of differentiated ambition and responsibility in the CBD is lacking, additionally it only plays a marginal role in the Global Report (Hampton-Smith et al. 2024; Koloffon Rosas et al. forthcoming; Lehmann et al. 2026).

For a nuanced discussion on responsibility and justice in the context of sharing the benefits and burdens of biodiversity target implementation, there needs to be some basis for judging what constitutes a just contribution, given differences in for example responsibility, capacity, benefits, and needs. We can apply different principles for allocating responsibility to assess whether a certain contribution by a Party can be considered just or not. For example, the 'contributor pays' principle, known from climate justice debates as the polluter pays principle, is based on the intuitive principle of *if you broke it, you fix it*, meaning that whoever causes a problem ought to take responsibility for eliminating its adverse consequences (Lehmann et al. 2026, p 4). This principle was for example applied in relation to GBF target 19 on finance mobilisation to apportion responsibility in biodiversity finance (Pettinotti et al. 2024). The 'beneficiary pays' principle follows a similar logic but shifts attention from contributors to beneficiaries by emphasising that those who have gained from environmentally harmful past activities should bear additional costs (Lehmann et al., 2026, pp 5-6). The principle of 'right to development' emphasises that all countries have their right to meet a certain level of development, and a certain level of livelihood, which has to be exempted from considerations of responsibility for biodiversity harm and potential burden sharing (Lehmann et al. 2026, p. 6; UN General Assembly 1986). Interestingly, this principle is taken up under GBF Section C, and further operationalised to the biodiversity context by aiming to enable 'responsible and sustainable socioeconomic development that, at the same time, contributes to the conservation and sustainable use of biodiversity' (CBD 2022). All of these principles, in turn, can be operationalised differently in practice. How the principles could be measured and translated into a national share of effort is a separate and largely political question, which we do not address here.

The three principles discussed above are widely recognised in global environmental justice debates; however, it is important to note that other principles also exist. Each principle has different implications and challenges, which are shaped by its underlying assumptions about what is fair. In turn, applying different principles (potentially) leads to different policies and outcomes for stakeholders. Still, making these principles explicit for different targets can help clarify the assumptions about justice that underpin different approaches to allocating responsibility, and the implications these have for Parties' contributions to GBF implementation (Lehmann et al. 2026; Oates and Minderhoud 2026; see Textbox 3.2 for examples).

Textbox 3.2: Examples of implications in applying distribution principles in T16 implementation

GBF target 16 focuses on sustainable consumption and footprint reduction. In aiming for reduction of the footprint of consumption, the role of especially consumers is highlighted in this GBF target, though environmental pressures are generated throughout the entire supply-chain. Therefore, in order to achieve footprint reduction, there is a shared responsibility amongst all supply-chain actors; consumers as well as producers (van Oorschot et al. 2026 provide an analysis of the Dutch footprint as contribution to the GBF). How these responsibilities are distributed amongst countries can be identified using different distribution principles. Three of these principles and their implications for GBF target 16 implementation are introduced below. For a more thorough exploration of each principle, see Lehmann et al. (2026).

Contributor pays: According to this principle, countries that are particularly strongly driving biodiversity loss and degradation through consumption patterns ought to take particularly strong action to transform their supply chains. As no country has zero biodiversity footprint, this principle requires all countries to take domestic action and bear direct costs of implementing GBF target 16. However, given the vast differences in countries' contributions to biodiversity loss, their responsibility is not only common but also different. High-income countries with high external biodiversity footprints are, when applying this principle, under particular obligation to stop externalizing pollution and overuse of biological resources in other countries.

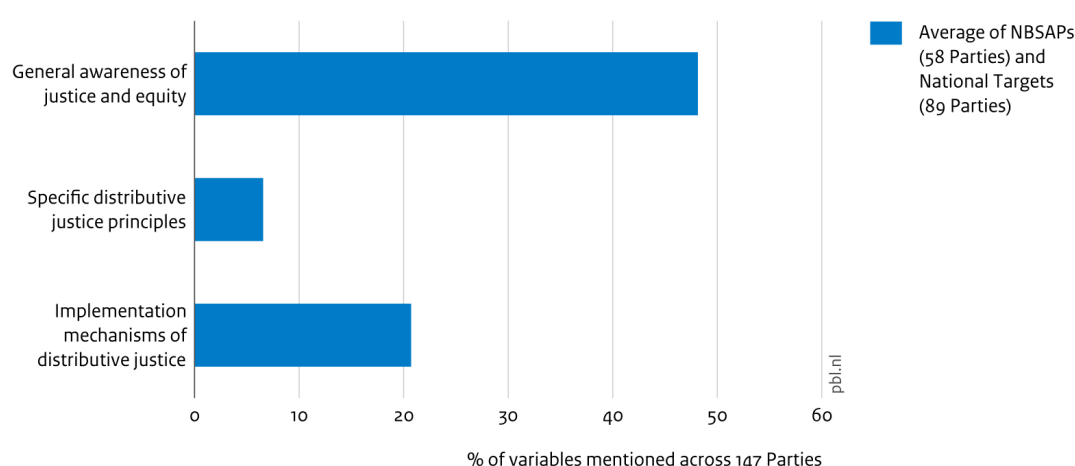
Beneficiary pays: In applying this principle, those who have gained from environmentally harmful past activities should bear costs of biodiversity action. For example, economic growth associated with industrialization in Europe was significantly fuelled by large-scale exploitation of natural resources in the colonies. It is partly the wealth created through these environmentally destructive processes that lay the foundation of differences in wealth across countries. Countries that have particularly benefited from driving biodiversity loss and degradation in other countries through their consumption footprints ought to take particularly strong action for biodiversity and footprint reduction.

Right to development: This principle emphasises countries' rights to meet a certain level of development, which has to be exempted from considerations of responsibility to biodiversity harm and benefit sharing. In the context of target 16 this would entail that for some countries, development is seen as priority, and the implementation of the target is the responsibility of countries that have already reached a certain level of development. However, within the context of the GBF, enabling responsible and sustainable development is supplemented with a focus on contributing to conservation and sustainable use. Resultingly, it is important to consider how developing supply chains in developing countries already can take biodiversity and sustainable use in consideration.

Our analysis of NBSAPs and national targets (Koloffon Rosas et al. in prep) shows that there is little substantive and explicit engagement with distribution principles for allocating international responsibility in national policy plans (Figure 3.5). Most NBSAPs show a high general recognition concerning distributions of responsibility allocation, frequently using language also embedded in the GBF itself. Despite these more general references to ideas of justice and equity, Parties rarely define what this means to them specifically. Specific international mechanisms on providing or receiving support for implementation, such as finance, capacity building, or technology transfer, are mentioned more often. These Parties often explicitly describe a need for means of implementation, specifically financial aid, to be able to implement national policies. Countries are thus generally

more explicit about the forms of support they need or will provide than about the principles on which distributions can be based (Figure 3.5). Providing and receiving support are not necessarily opposing roles. This is particularly notable in the analysed NBSAPs: out of the 58 NBSAPs analysed, 20 Parties position themselves as recipients of international support, 10 as providers, and 18 Parties position themselves as both, depending on different required actions. This mixed group cuts across income levels, showing that countries can simultaneously articulate their own support needs and identify contributions they can make to biodiversity action elsewhere.

Figure 3.5
Distributive justice variables mentioned in NBSAPs and National Targets



Source: CBD ORT, NBSAPS 13/11/2026, National Targets 23/03/2026; analysis VU-IVM and PBL

In Parties' discussions on GBF implementation, the topic of differentiating ambition and responsibility is not completely absent. For example, during discussions as part of the Subsidiary Body meetings and Kunming Dialogues preceding COP-17 (IISD 2026a; 2026b), multiple issues and considerations were raised by many different Parties and stakeholders that are especially relevant when discussing differentiated responsibilities. Parties highlighted that the lack of alignment between national targets, reported implementation, and the GBF targets often stems from differences in national circumstances and priorities. Additionally, it was also noted that the findings of the Global Report should be interpreted while accounting for national circumstances and capabilities, as well as keeping in mind the distinction between gaps in implementation and gaps in data as well as monitoring and reporting capabilities. Still, less attention seems to go to what responsibility, and a fair differentiation of GBF implementation could look like, or how to discuss this topic.

Addressing the efforts to meet the 2050 goals will benefit from a more explicit consideration of national responsibilities in target implementation, but it is difficult to address this issue. As a starting point, a dialogue on this topic could be initiated in the CBD's broad policy space, to better understand positions and to find a way to better recognise diversity in backgrounds, preferences, and priorities. This could also be regionally addressed in the context of the work of the subregional technical and scientific cooperation support centres of the CBD. Differentiating responsibility will remain a sensitive issue within the CBD but engaging with these questions and examining how Parties invoke different distribution principles can inform discussions on justice and responsibility

in accelerated implementation, which will be an important step for the post-2030 framework, towards achieving the 2050 goals.

4 Strengthening the long-term perspective in the CBD framework through the Global Review Process

In this section, we take up the findings of this policy brief and reflect on the question of how the CBD Global Review process could contribute to strengthening long term biodiversity policies. Building on our analysis in Landry et al. (2026), we start with briefly taking stock where the Global Review process currently stands, and we then identify how the Global Review could further develop to increase the CBD's effectiveness. Our starting point is that the Global Review has the potential to turn a diagnosis of collective progress towards the 2030 and 2050 goals into learning, and into political follow-up to provide direction and action on the ground. COP-17, then, is the moment to decide on steps to accelerate implementation through the 'Yerevan pathway': national uptake, international cooperation, creation of coalitions and partnerships, continuous learning towards the second Global Review, and putting in place the process towards the CBD post-2030 framework.

It is evident that biodiversity outcomes are shaped by dynamics that extend beyond conventional biodiversity conservation and restoration policies. These dynamics regard, amongst others, climate change, agrifood systems, international trade, financial flows, urban and infrastructure development, energy transitions, and geopolitical relations. While the CBD was established around three equally important objectives – conservation, sustainable use, and fair and equitable benefit-sharing – its governance processes and policy instruments have historically and still, today, been more strongly oriented towards conservation. Addressing sustainable use, and particularly the underlying drivers of biodiversity loss, requires engaging with economic sectors, development priorities, and policy decisions that fall outside the traditional remit of environmental institutions. This creates a governance and responsibility challenge (Billé, et al. 2010): the Convention's objectives increasingly depend on transformations that biodiversity institutions and environmental actors (who are often the ones represented at the CBD) cannot deliver alone yet must find ways to influence and enable. At the same time, the challenges to the CBD and multilateral system in the current geopolitical context are increasing. This multilateral system is under pressure, budgets are increasingly constrained, and nature is competing with other topics on the political agenda.

Future biodiversity policies need to consider and influence these dynamics to meet the 2050 goals of the CBD and make nature goals part of the transition pathways towards sustainability emerging in these domains. In this regard, the GBF, the Yerevan Pathway, and the new CBD post-2030 framework could be understood as a platform for multiple pathways of implementation towards the 2050 goals. Some suggestions for such pathways follow from the scenario-analysis in this policy brief such as changes towards plant-based diets, addressing footprints of production and consumption, and an energy transition that deals with trade-offs and synergies between nature and climate policy. Other related pathways are also necessary, for example means of implementation (finance, technology, knowledge), subsidy reform, rights-based approaches. The Global Review is proving itself as a mechanism for course correction and guidance and provides an opportunity to strengthen the workings of the CBD. Importantly, the first Global Review needs to be understood as the establishment of a new institutional mechanism. It is not yet a comprehensive assessment of implementation, but it already shows important results. Parties have

invested considerable efforts in implementing and aligning new NBSAPs, targets, monitoring systems, indicators, methodologies, national reports etc. These systems require a certain degree of stability to be operational, comparable and improved over time. The first Global Report already provides evidence regarding ambition gaps, implementation barriers and gaps, and resource constraints. These findings are also broadly accepted by Parties in the review process so far, providing a common basis for further decision-making.

Progress is lagging, yet most needed, in addressing direct and indirect drivers of biodiversity loss and structural changes in the real economy: agriculture and food, urban development, production and consumption system, integrated climate and biodiversity responses, finance and trade. COP-17 needs to prioritise actions around these issues for realising the CBD long-term ambitions and provide a mandate for the second Global Review that explicitly considers the evaluation of progress of pathways towards the long-term goals. To receive traction and realise a meaningful Yerevan Pathway, COP-17 would need to agree on a small number of issues that are key in realising the long-term outcomes of the GBF, potentially orchestrate or connect with coalitions or groups (sectoral, regional, thematic) to advance specific agendas, and foster solution-oriented dialogues to work on concrete and financeable implementation pathways and thereby make the results of these processes part of the second Global Review and the development of the CBD post-2030 framework.

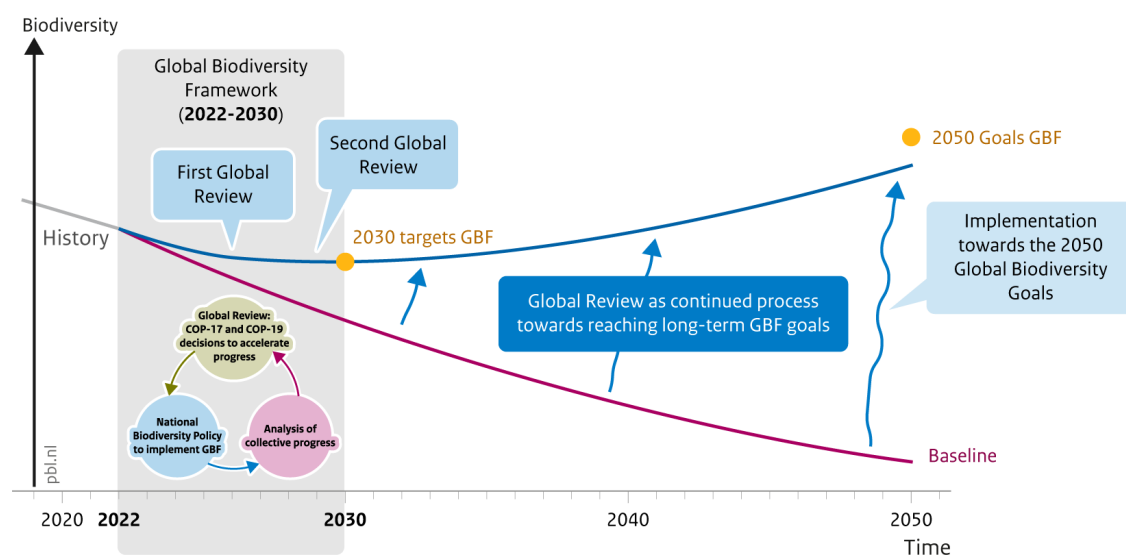
The second Global Review (starting after COP-18) will be the first real litmus test for the GBF. The first Global Review provided the baseline. The second Global Review will become the first full learning cycle of the GBF, and, by then, several improvements are expected to converge, such as more complete national reporting, improved monitoring and reporting systems, more lessons from implementation, new scientific evidence (including the IPBES 2nd Global Assessment), experience gained through implementation of pathways, and learning exercises coming out of the first Global Review, launched between now and 2029. The second Global Review will need to answer what works, for whom, under which conditions, what Parties could collectively do differently, perhaps also regionally or thematically. Recognising that biodiversity outcomes are determined in the real economy, future global reviews will need to strengthen the capacity of the CBD framework and mechanisms to show progress and inform action across the broader governance architecture relevant to nature. This goes beyond conventional ways of mainstreaming biodiversity and requires seeing mainstreaming as a way to achieve transformative changes for biodiversity. But the CBD cannot be expected to govern sectoral transformations and pathways on its own; other political processes need to amplify the transition pathways necessary for biodiversity.

COP-17 could encourage voluntary experimentation through coalitions, partnerships, platforms, sectoral initiatives testing different pathways (food systems, value chains) that need to be followed up at COP-18 and COP-19. More productive linkages between state and non-state action could be built around these pathways and international cooperation could support this further. To sustain momentum beyond COP-17, the Yerevan Pathway could provide a more continuous political space for connecting these initiatives, continuing identifying common implementation barriers and discussing the international cooperation needed to overcome them. To not only limit follow-up to successive COP decisions, this could also involve targeted dialogues between review cycles, bringing together Parties, relevant sectoral actors, and international institutions around specific transformation challenges, possibly the ones identified and negotiated at COP-17 as the key political outcomes based on the Global Review process.

Revitalising the non-state actor agenda around specific pathways can contribute here. This could also be connected with Action Agenda's and non-state action in UNFCCC, UNCCD, and other fora. This would also strengthen interactions between CBD and broader international governance processes (e.g. MEAs, development finance institutions, regional partnerships/organisations, G20), in recognition that many drivers originate outside biodiversity policy itself. Such initiatives would generate experience on implementation barriers and on how to resolve the difficult issues in those transition pathways. Their results could then feed into the second Global Review, allowing the CBD to evolve from evaluating progress based on National Reports towards facilitating more learning and, in the end, more capacity and will to act. The Global Review could become, beyond an accountability mechanism and a learning exercise, a platform for identifying collective international action. As such, coalitions or groups could be organised around specific sectors, pressures, or shared implementation bottlenecks, and their added value would be in identifying the conditions needed to make particular pathways feasible, where international cooperation can help overcome barriers that individual countries cannot address alone (whether due to capacity challenges or collective action dilemmas that discourage unilateral action) (see Figure 4.1).

Figure 4.1

Convention on Biological Diversity (CBD) review process working towards the 2050 goals



Source: PBL

In building the post-2030 agenda it will be necessary to connect the ecosystem of action and experimentation in the CBD, broader action for biodiversity in the real economy, and the Global Review process. Crucially, at COP-17, the (second) Global Review needs to contribute to shaping the post-2030 biodiversity agenda or framework. Moreover, decisions need to be taken to continue the review process as part of the post-2030 architecture. The review will provide a substantive evidence base for identifying what to improve, what to keep, what to change, and what will be the key focus of the next decade of actions. Without such connections, there is a risk of losing much of the collective learning generated, rather than using it to inform the next phase of global biodiversity governance.

Some of the questions for future review cycles following from the analysis provided here would include:

- What is progress in realising long-term pathways for biodiversity and what is holding back transformative change?
- Which barriers can be addressed nationally, and which require stronger international cooperation, including on finance, trade, and sectoral policies?
- Are key international cooperation mechanisms addressing the main drivers of biodiversity loss? Which governance approaches to do so are proving most effective?
- Are efforts sufficient and fairly distributed? How can different national responsibilities and capacities be reflected?
- Where are additional collective efforts required towards 2040 and 2050? How can the Global Review help identify shared priorities and mobilise relevant actors?

References

- Affinito, F., T. Hirsch, N.D. Burgess, J.E. Campbell, C. Eghenter, O.A. El-Kawy, S. Hashimoto, A. Kammwamba, M. Kok, W.A. Mala, A. Shestakov, A. Stott, U. Tariq, J. Tauli, & E. Nicholson (2026), 'Understanding the Global Report on collective progress in the implementation of the Kunming-Montreal Global Biodiversity Framework: Purpose, content, and science-policy engagement', policy brief
- Alkemade, R., M. van Oorschot, L. Miles, C. Nellemann, M. Bakkenes, & B. ten Brink (2009), 'GLO BIO3: A framework to investigate options for reducing global terrestrial biodiversity loss', *Ecosystems* 12(3): pp. 374-390.
- Aschi, F., S.C. Dekker, D. Leclère, A. Marques, C. Neumann, G. Ambrosio, & D.P. van Vuuren (2026), 'Can we bend the curve: Trends in global biodiversity scenarios', *Science Advances* 12(6).
- Billé, R., E. Bruoghton, L. Chabason, C. Chiarolla, M. Jardin, G. Kleitz, J.-P. le Duc, & L. Mermet (2010), 'Global governance of biodiversity', *Health and Environment Reports* (6).
- Campaign for Nature (2026), *30x30 global assessment 2026*, Washington: Campaign for Nature.
- CBD (2022), *Kunming-Montreal Global Biodiversity Framework*, CBD/COP/DEC/15/4, Montreal: Secretariat of the Convention on Biological Diversity.
- CBD (2026), *The Global Report on collective progress in the implementation of the Kunming-Montreal Global Biodiversity Framework*, Montreal: Secretariat of the Convention on Biological Diversity.
- Chan, S., S. Bauer, M.M. Betsill, et al. (2023), 'The Global Biodiversity Framework needs a robust action agenda', *Nature Ecology & Evolution* 7: pp. 172-173.
- Ellen Macarthur Foundation (2026), *Briefing to COP17 negotiators and observers: Supporting circular economy and nature synergies in COP17 decisions*, policy brief.
- den Elzen, M., E. Hooijschuur, I. Dafnomilis, A. Beusen, M. Dekker, T. Kuramochi, S. Solf, I.S. Tagamori, & D.P. van Vuuren (2026), *Analysis of the impact and ambition of the new NDCs for 2035: Paris Climate Goal is further out of reach*, The Hague: PBL Netherlands Environmental Assessment Agency.
- Durán, A.P., J.J. Kuiper, A.P.D. et al. (2023), 'Bringing the futures framework to life: Creating a set of illustrative narratives of nature futures', *Sustainability Science* 21: pp. 2007-2026.
- FAO (2026), *Agrifood systems in National Biodiversity Strategies and Action Plans*, policy brief.
- FAO (2019), *The state of the world's biodiversity for food and agriculture*, policy brief.
- Forest Peoples Programme (2026), *Local Biodiversity Outlook 3*, policy brief.
- Gibson, M., M. Sundiang, D. Mason-D'Croz, T.D. Oliveira, F. Beier, L. Benavidez, A. Bos, M. Chepeliev, J. Doelman, S. Dunston, S. Fujimori, T. Hasegawa, P. Havlik, J. Hristov, J. Jägermeyr, M. Kozicka, M. Kuiper, P. Kyle, T. de Lange, B.L. Bodirsky, H. Lotze-Campen, H. Luchtenbelt, D.M.-C. Chen, A. Mishra, C. Müller, G. Nelson, A. Palazzo, I.P. Dominguez, A. Popp, R. Sands, M. Springmann, E. Stehfest, T.B. Sulser, K. Takahashi, G. Tassinari, F. Thom, P. Thornton, K. Tsuchiya, W.-J. van Zeist, H. van Meijl, D. van der Mensbrugghe, D.P. van Vuuren, H.E. van Zanten, I. Weindl, K. Wiebe, X. Zhao, & M. Herrero (2026), 'Food systems transformation would reshape global agriculture', *Nature* 657(8130): pp. 156-163.
- Hajer, M.A., & J. Oomen (2025), *Captured futures: Rethinking the drama of environmental politics*, 1st edn., Oxford: Oxford University Press.
- Hale, T. (2024), *Long problems: Climate change and the challenge of governing across time*, Princeton: Princeton University Press.

- Hampton-Smith, M., G.G. Gurney, T.H. Morrison, & J.E. Cinner (2024), 'Equity in global conservation policy varies in clarity and comprehensiveness', *One Earth* 7(11): pp. 1970-1980.
- Hooijschuur, E., M. den Elzen, I. Dafnomilis, A. Beusen, M. Dekker, S. Solf, I.S. Tagomori, & D.P. van Vuuren (2026), *The new NDCs for 2035: Emissions impact and ambition analysed*, The Hague: PBL Netherlands Environmental Assessment Agency.
- IISD (2026a), *Earth negotiations bulletin: Kunming dialogues*, policy brief.
- IISD (2026b), *Earth negotiations bulletin: SBSTTA 28/SBI7*, policy brief.
- Immerzeel, R., M. Kok, S. Troost, & C. Krüger (2026), *From global ambition to national commitments: National target setting under the Global Biodiversity Framework*, The Hague: PBL Netherlands Environmental Assessment Agency.
- IPBES (2019), *Global Assessment report summary for policymakers*, R.T. Watson, I.A. Baste, A. Larigauderie, P. Leadley, U. Pascual, B. Baptiste, S. Demissew, L. Dziba, G. Erpul, A.M. Fazel, M. Fischer, A.M. Hernández, M. Karki, V. Mathur, T. Pataridze, I.S. Pinto, M. Stenseke, K. Török, & B. Vilá (eds), Bonn: IPBES.
- IPBES (2023), *The Nature Futures Framework, a flexible tool to support the development of scenarios and models of desirable futures for people, nature and Mother Earth and its methodological guidance*, P. Balvanera, U. Pascual, M. Christie, & d. González-Jiménez (eds), Bonn: IPBES.
- IPBES (2025), *Thematic assessment report on the underlying causes of biodiversity loss and the determinants of transformative change and options for achieving the 2050 vision for biodiversity of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*, K. O'Brien, L. Garibaldi, & A. Agrawal (eds), Bonn: IPBES.
- Janse, J.H., J.J. Kuiper, M.J. Weijters, E.P. Westerbeek, M.H.J.L. Jeuken, M. Bakkenes, R. Alkemade, W.M. Mooij, & J.T.A. Verhoeven (2015), 'GLOBIO-Aquatic, a global model of human impact on the biodiversity of inland aquatic ecosystems', *Environmental Science & Policy* 48: pp. 99-114.
- Karlsson-Vinkhuyzen, S., E. Boelee, J. Cools, L. van Hoof, O. Hospes, M. Kok, J. Peerlings, J. van Tatenhove, C.J.A.M. Termeer, & I.J. Visseren-Hamakers (2018), 'Identifying barriers and levers of biodiversity mainstreaming in four cases of transnational governance of land and water', *Environmental Science & Policy* 85: pp. 132-140.
- Kok, M., A. Marques, M. Bakkenes, J. Doelman, J. Hilbers, R. Immerzeel, C. Krüger, & A. Schipper (2024), *A prospective evaluation of the ambition of the Kunming-Montreal Global Biodiversity Framework: A contribution to the CBD review process*, The Hague: PBL Netherlands Environmental Assessment Agency.
- Kok, M.T.J., & K. Ludwig (2022), '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: Politics, Law and Economics* 22(1): pp. 1-25.
- Kok, M.T.J., J.R. Meijer, W.-J. van Zeist, J.P. Hilbers, M. Immovilli, J.H. Janse, E. Stehfest, M. Bakkenes, A. Tabeau, A.M. Schipper, & R. Alkemade (2023), 'Assessing ambitious nature conservation strategies in a below 2-degree and food-secure world', *Biological Conservation* 248(110068).
- Kok, M., O. Widerberg, K. Negacz, C. Bliss, & P. Pattberg (2019), *Opportunities for the action agenda for nature and people*, The Hague: PBL Netherlands Environmental Assessment Agency.
- Landry, J., M. Kok, R. Immerzeel, A. Hallosserie, & M. Fofana (2026), *Operationalising the Biodiversity Global Review to strengthen CBD effectiveness: Priorities for COP17 and beyond*, policy brief.

- Leadley, P., A. Gonzalez, D. Obura, C.B. Krug, M.C. Londoño-Murcia, K.L. Millette, A. Radulovici, A. Rankovic, L.J. Shannon, E. Archer, F.A. Armah, N. Bax, K. Chaudhari, M.J. Costello, L.M. Dávalos, F.D.O. Roque, F. DeClerck, L.E. Dee, F. Essl, S. Ferrier, P. Genovesi, M.R. Guariguata, S. Hashimoto, C.I. Speranza, F. Isbell, M. Kok, S.D. Lavery, D. Leclère, R. Loyola, S. Lwasa, M. McGeoch, A.S. Mori, E. Nicholson, J.S. Ochoa, K. Öllerer, S. Polasky, C. Rondinini, S. Schroer, O. Selomane, X. Shen, B. Strassburg, U.R. Sumaila, D.P. Tittensor, E. Turak, L. Urbina, M. Vallejos, E. Vázquez-Domínguez, P.H. Verburg, P. Visconti, S. Woodley, & J. Xu (2022), 'Achieving global biodiversity goals by 2050 requires urgent and integrated actions', *One Earth* 5(6): pp. 597-603.
- Leclère, D., M. Obersteiner, M. Barrett, S.H.M. Butchart, A. Chaudhary, A. De Palma, F.A.J. DeClerck, M. Di Marco, J.C. Doelman, M. Dürauer, R. Freeman, M. Harfoot, T. Hasegawa, S. Hellweg, J.P. Hilbers, S.L.L. Hill, F. Humpenöder, N. Jennings, T. Krisztin, G.M. Mace, H. Ohashi, A. Popp, A. Purvis, A.M. Schipper, A. Tabeau, H. Valin, H. van Meijl, W.-J. van Zeist, P. Visconti, R. Alkemade, R. Almond, G. Bunting, N.D. Burgess, S.E. Cornell, F. di Fulvio, S. Ferrier, S. Fritz, S. Fujimori, M. Grooten, T. Harwood, P. Havlík, M. Herrero, A.J. Hoskins, M. Jung, T. Kram, H. Lotze-Campen, T. Matsui, C. Meyer, D. Nel, T. Newbold, G. Schmidt-Traub, E. Stehfest, B.B.N. Strassburg, D.P. van Vuuren, C. Ware, J.E.M. Watson, W. Wu, & L. Young (2020), 'Bending the curve of terrestrial biodiversity needs an integrated strategy', *Nature* 585(7826): pp. 551-556.
- Lehmann, I., M. Kok, R. Immerzeel, & A. Marques (2026), 'Implications of global distributive justice principles for implementation of the Kunming-Montreal Global Biodiversity Framework', *Conservation Biology* 40(1).
- Negacz, K., O. Widerberg, T. van der Molen, J. Smaoui, M. Kok, & Philipp Pattberg (2026), *Bio* IV: Mapping the landscape of international and transnational cooperative initiatives for biodiversity*, IVM Report.
- Neumann, C., R. Alkemade, D.P. van Vuuren, A. Burian, F. Aschi, & R. Seppelt (2026), 'Global interventions show synergistic but uneven positive impacts on climate and biodiversity', *One Earth* 101684.
- Oates, L., & K. Minderhoud (2026), *Justice, direction, responsibility*, The Hague: PBL Netherlands Environmental Assessment Agency.
- Obura, D.O., F. DeClerck, P.H. Verburg, J. Gupta, J.F. Abrams, X. Bai, S. Bunn, K.L. Ebi, L. Gifford, C. Gordon, L. Jacobson, T.M. Lenton, D. Liverman, A. Mohamed, K. Prodani, J.C. Rocha, J. Rockström, B. Sakschewski, B. Stewart-Koster, D. van Vuuren, R. Winkelmann, & C. Zimm (2023), *One Earth* 6(2).
- van Oorschot, M., H. Brink, M. Kok, P. Lucal, G. Luteijn, T. Maas, R. van der Veen, D. in 't Veld, H. Westhoek, & H. Wilting (2026), *Opties voor het verkleinen van de Nederlandse voetafdruk: Mogelijkheden om door interventies in productieketens de Nederlandse voetafdruk van consumptie op de wereldwijde biodiversiteit te verkleinen*, The Hague: PBL Netherlands Environmental Assessment Agency.
- Pattberg, P., O. Widerberg, & M.T.J. Kok (2019), 'Towards a global biodiversity action agenda', *Global Policy* 10(3): pp. 385-390.
- Pereira, H.M., I.S. Martins, I.M.D. Rosa, H. Kim, P. Leadley, A. Popp, D.P. van Vuuren, G. Hurtt, L. Quoss, A. Arneth, D. Baisero, M. Bakkenes, R. Chaplin-Kramer, L. Chini, M. di Marco, S. Ferrier, S. Fujimori, C.A. Guerra, M. Harfoot, T.D. Harwood, T. Hasegawa, V. Haverd, P. Havlík, S. Hellweg, J.P. Hilbers, S.L.L. Hill, A. Hirata, A.J. Hoskins, F. Humpenöder, J.H. Janse, W. Jetz, J.A. Johnson, A. Krause, D. Leclère, T. Matsui, J.R. Meijer, C. Merow, M. Obersteiner, H. Ohashi, A. de Palma, B. Poulter, A. Purvis, B. Quesada, C. Rondinini, A.M. Schipper, J. Settele, R. Sharp, E. Stehfest, B.B.N. Strassburg, K. Takahashi, L. Talluto, W. Thuiller, N.

- Titeux, P. Visconti, C. Ware, F. Wolf, & R. Alkemade (2024), 'Global trends and scenarios for terrestrial biodiversity and ecosystem services from 1900 to 2050', *Science* 384(6694): pp. 458-465.
- Pettinotti, L., Y. Cao, T. Kamninga, & S. Colenbrander (2024), 'A fair share of biodiversity finance? Apportioning responsibility for the \$20 billion target by 2025', ODI working paper, London: ODI.
- Reyes-García, V., M.K. Rainer, A. Agrawal, K. Benessaiah, M. Bonilla-Moheno, J. Claudet, T. Forsyth, L.A. Garibaldi, B. Gemmill-Herren, C. Guibal, B.E. Goldstein, H. Gosnell, X. Guo, P. Huntjens, C.I. Speranza, J. Leventon, L.S. de Lima, R.A. Magris, K. Miwa, J.S. Molina, K. O'Brien, R. Pandit, L. Pereira, K. Raab, A. Scheidel, P. Tittonnell, P. Ugarte-Lucas, S. Villasante, & Y. Zinngrebe (2026), 'Actions and actors during transformative change for global sustainability', *Nature Sustainability* 9: pp. 595-603.
- Riahi, K., D.P. Van Vuuren, E. Kriegler, J. Edmonds, B.C. O'Neill, S. Fujimori, N. Bauer, K. Calvin, R. Dellink, O. Fricko, W. Lutz, A. Popp, J. Crespo Cuaresma, S. Kc, M. Leimbach, L. Jiang, T. Kram, S. Rao, J. Emmerling, K. Ebi, T. Hasegawa, P. Havlík, F. Humpenöder, L.A. Da Silva, S. Smith, E. Stehfest, V. Bosetti, J. Eom, D. Gernaat, T. Masui, J. Rogelj, J. Strefler, L. Drouet, V. Krey, G. Luderer, M. Harmsen, K. Takahashi, L. Baumstark, J.C. Doelman, M. Kainuma, Z. Klimont, G. Marangoni, H. Lotze-Campen, M. Obersteiner, A. Tabeau, & M. Tavoni (2017), 'The Shared Socioeconomic Pathways and their energy, land use, and greenhouse gas emissions implications: An overview'. *Global Environmental Change* 42: pp. 153-68.
- Schipper, A.M., J.P. Hilbers, J.R. Meijer, L.H. Antão, A. Benítez-López, M.M.J. De Jonge, L.H. Leemans, E. Scheper, R. Alkemade, J.C. Doelman, S. Mylius, E. Stehfest, D.P. Van Vuuren, W.-J. Van Zeist, & M.A.J. Huijbregts (2020), 'Projecting terrestrial biodiversity intactness with GLOBIO 4', *Global Change Biology* 26(2): pp. 760-71.
- Secretariat of the Convention on Biological Diversity (SCBD) (2014), *Global Biodiversity Outlook 4*, Montreal: Secretariat of the Convention on Biological Diversity.
- Secretariat of the Convention on Biological Diversity (SCBD) (2020), *Global Biodiversity Outlook 5* Montreal: Secretariat of the Convention on Biological Diversity.
- Stehfest, E., D.P. van Vuuren, P. Kram, A.F. Bouwman, R. Alkemade, M. Bakkenes, H. Biemans, A. Bouwman, M. den Elzen, J. Janse, P.L. Lucas, J. van Minnen, M. Müller, & A. Prins (2014), *Integrated assessment of global environmental change with IMAGE 3.0*, The Hague: PBL Netherlands Environmental Assessment Agency.
- Termeer, C.J.A.M., & A. Dewulf (2019), 'A small wins framework to overcome the evaluation paradox of governing wicked problems', *Policy and Society* 38(2): pp. 298-314.
- UN General Assembly (1986), *Resolution 41/128: Declaration on the Right to Development*, policy brief.
- UNEP-WCMC (2026). *Biofutures: Biodiversity modelling and scenarios for the goals and targets of the Kunming-Montreal Global Biodiversity Framework*, policy brief.
- van Vuuren, D.P., J.C. Doelman, I. Schmidt Tagomori, A.H.W. Beusen, S.E. Cornell, J. Röckström, A.M. Schipper, E. Stehfest, G. Ambrosio, M. Van Den Berg, L. Bouwman, V. Daioglou, M. Harmsen, P. Lucas, K.I. Van Der Wijst, & W.-J. Van Zeist (2025), 'Exploring Pathways for World Development within Planetary Boundaries', *Nature* 641(8064): pp. 910-16.
- van Vuuren, D.P., E. Stehfest, D. Gernaat, H.-S. De Boer, V. Daioglou, J. Doelman, O. Edelenbosch, M. Harmsen, W.-J. Van Zeist, M. Van Den Berg, I. Dafnomilis, M. Van Sluisveld, A. Tabeau, L. De Vos, L. De Waal, N. Van Den Berg, A. Beusen, A. Bos, H. Biemans, L. Bouwman, H.-H. Chen, S. Deetman, A. Dagnachew, A. Hof, H. Van Meijl, J. Meyer, S. Mikropoulos, M.

- Roelfsema, A. Schipper, H. Van Soest, I. Tagomori, & V. Zapata Castillo (2021), 'The 2021 SSP scenarios of the IMAGE 3.2 Model', working paper.
- Verwoerd, L.E., E. Kunseler, J. Loudon, T. Maas, S. van der Hel, & K. Kok (2026), *Werken aan transformatie*, The Hague: PBL Netherlands Environmental Assessment Agency.
- Widerberg, O., M. Kok, K. Negacz, M. Petersson, & P. Pattenberg (2021), *Accountability of commitments by non-state actors in the CBD post-2020 Global Biodiversity Framework*, policy brief.
- WWF (2026), *Living Planet Report 2026 – The science of hope*, Gland: WWF.

Appendix 1: List of specific references on which the policy brief is based

- Alkemade, Rob, Mark Van Oorschot, Lera Miles, Christian Nellemann, Michel Bakkenes, and Ben Ten Brink. 2009. 'GLOBIO3: A Framework to Investigate Options for Reducing Global Terrestrial Biodiversity Loss'. *Ecosystems* 12(3):374–90. doi:10.1007/s10021-009-9229-5.
- Hooijschuur, Elena, Michel den Elzen, Ioannis Dafnomilis, Arthur Beusen, Mark Dekker, Stephanie Solf, Isabela Schmidt Tagomori, and Detlef Van Vuuren. 2026. 'The New NDCs for 2035: Emissions Impact and Ambition Analysed'. The Hague: PBL Netherlands Environmental Assessment Agency.
- Immerzeel, Roos, Marcel Kok, Stefan Troost, and Christoph Krüger. 2026. 'From Global Ambition to National Commitments: National Target Setting under the Global Biodiversity Framework'. The Hague: PBL Netherlands Environmental Assessment Agency.
- Janse, J. H., J. J. Kuiper, M. J. Weijters, E. P. Westerbeek, M. H. J. L. Jeuken, M. Bakkenes, R. Alkemade, W. M. Mooij, and J. T. A. Verhoeven. 2015. 'GLOBIO-Aquatic, a Global Model of Human Impact on the Biodiversity of Inland Aquatic Ecosystems'. *Environmental Science & Policy* 48:99–114. doi:10.1016/j.envsci.2014.12.007.
- Kok, Marcel, Alexandra Marques, Michel Bakkenes, Jonathan Doelman, Jelle Hilbers, Roos Immerzeel, Christoph Krüger, and Aafke Schipper. 2024. 'A Prospective Evaluation of the Ambition of the Kunming-Montreal Global Biodiversity Framework: A Contribution to the CBD Review Process'. The Hague: PBL Netherlands Environmental Assessment Agency.
- Kok, Marcel, Alexandra Marques, Michel Bakkenes, Jonathan Doelman, Jelle Hilbers, Roos Immerzeel, Christoph Krüger, and Aafke Schipper. In prep. 'A prospective analysis of the ambition of the CBD Kunming-Montreal Global Biodiversity Framework towards achieving its 2050 goals to protect, restore and prosper with nature' (working title).
- Koloffon Rosas, Montserrat, Ina Lehmann, Roos Immerzeel, Marcel Kok and Pippa Hofman. In prep. 'National Biodiversity Strategies and Action Plans and National Targets under the Kunming-Montreal Global Biodiversity Framework in light of distributive justice (working title)'.
- Landry, Juliette, Marcel Kok, Roos Immerzeel, Agnès Hallosserie, and Mariam Fofana. 2026. 'Operationalizing the Biodiversity Global Review to Strengthen CBD Effectiveness: Priorities for COP17 and Beyond'.
- Lehmann, Ina, Marcel Kok, Roos Immerzeel, and Alexandra Marques. 2026. 'Implications of Global Distributive Justice Principles for Implementation of the Kunming-Montreal Global Biodiversity Framework'. *Conservation Biology* e70167. doi:10.1111/cobi.70167.
- Negacz, Katarzyna, Oscar Widerberg, T. van der Molen, J. Smaoui, Marcel Kok, and Philipp Pattberg. 2026. 'Bio* IV: Mapping the Landscape of International and Transnational Cooperative Initiatives for Biodiversity'. *IVM Report*.
- Schipper, Aafke M., Jelle P. Hilbers, Johan R. Meijer, Laura H. Antão, Ana Benítez-López, Melinda M. J. De Jonge, Luuk H. Leemans, Eddy Scheper, Rob Alkemade, Jonathan C. Doelman, Sido Mylius, Elke Stehfest, Detlef P. Van Vuuren, Willem-Jan Van Zeist, and Mark A. J. Huijbregts. 2020. 'Projecting Terrestrial Biodiversity Intactness with GLOBIO 4'. *Global Change Biology* 26(2):760–71. doi:10.1111/gcb.14848.

Stehfest, Elke, Detlef Van Vuuren, P. Kram, A. F. Bouwman, Rob Alkemade, Michel Bakkenes, H. Biemans, A. Bouwman, M. den Elzen, J. Janse, Paul L. Lucas, J. van Minnen, M. Müller, and A. Prins. 2014. 'Integrated Assessment of Global Environmental Change with IMAGE 3.0'. The Hague: PBL Netherlands Environmental Assessment Agency.

Appendix 2: Key assumptions in the six scenarios concerning the GBF targets implemented in our modelling framework

All scenarios follow SSP2 and GDP projections (Riahi et al. 2018, van Vuuren et al. 2021).

	Target 1 - <i>Plan and Manage all Areas to Reduce Biodiversity Loss</i>	Target 2 - <i>Restore 30% of all Degraded Ecosystems</i>	Target 3 - <i>Conserve 30% of Land, Waters, and Seas</i>
Baseline	-		14% current protected areas following World Database on Protected Areas (WDPA) and OECMs.
National Targets (NT)	-	Restore degraded ecosystems areas mentioned in quantitative national targets in 2030 with combination of reversion and rehabilitation in line with Bending the Curve 2 (BtC2) assumptions.	Protect terrestrial land areas as mentioned as mentioned in quantitative national targets
National Targets Optimistic (NTO)	-	Restore degraded ecosystems areas mentioned in quantitative national plan shares and corresponding world region in 2030 when area share with quantitative targets > 50% with combination of reversion and rehabilitation in line with BtC2 assumptions.	Protect terrestrial land areas as mentioned in quantitative and qualitative national targets
Global Biodiversity Framework (GBF)	Total agricultural land is not allowed to increase after 2030 .	30% restoration globally in line with GBF. Combination of reversion and rehabilitation in line with BtC2 assumptions.	30% protection of terrestrial lands and freshwater systems is achieved by 2030.
GBF + Nationally Determined Contributions (NDC)	GBF	GBF	GBF
High Environmental Ambition (HEA)	GBF	30% restoration of terrestrial lands is achieved by 2030, 50% restoration globally in 2050. Combination of conversion and rehabilitation in line with Bt2C assumptions.	30% protection of terrestrial lands is achieved by 2030 and 50% by 2050.

	Target 8 - <i>Minimise the Impacts of Climate Change on Biodiversity and Build Resilience</i>	Target 10 - <i>Enhance Biodiversity and Sustainability in Agriculture, Aquaculture, Fisheries, and Forestry</i>	Target 11 - <i>Restore, Maintain, and Enhance Nature's Contributions to People</i>	Target 16 - <i>Enable Sustainable Consumption Choices to Reduce Waste and Overconsumption</i>
Baseline	Current policies in energy, industry and AFOLU sectors (Dafnomilis et al 2025)	-	-	-
National Targets (NT)	Baseline	-	-	-
National Targets Optimistic (NTO)	Baseline	-	-	-
Global Biodiversity Framework (GBF)	Baseline	- Strong increase in irrigation efficiency to reduce freshwater withdrawals. - All forest management transitions to natural forest management with reduced impact logging, except for forest plantations that are maintained at baseline levels to limit pressure on natural forests.	High carbon forests, riparian zones, water retention areas, and peatlands are protected in order to ensure that NCPs are maintained and enhanced.	- By 2050, 50% of the global population adopts a healthy diet (Rockström et al 2025) with reduced intake of livestock products, higher intake of legumes, and a sufficient caloric intake (i.e. no undernutrition or overconsumption). - Globally, food waste is reduced by 50% in 2050.
GBF + Nationally Determined Contributions (NDC)	Climate policies in line with Nationally Determined Contributions in energy, industry sectors (Hooijschuur et al 2026) and current policies in the AFOLU sector (Dafnomilis et al 2025)	GBF	GBF	GBF
High Environmental Ambition (HEA)	Climate policies consistent with the Paris Agreement, i.e. limiting global warming to well below 2°C by the end of the century. A mitigation pathway is used that minimizes impacts on biodiversity from mitigation options (notably biofuels) and relies heavily on demand side measures and changing consumption patterns (Popp et al. in review).	GBF	GBF	By 2050, 100% of the global population adopts a healthy diet (Rockström et al 2025) with reduced intake of livestock products, higher intake of legumes, and a sufficient caloric intake (i.e. no undernutrition or overconsumption). - Globally, food waste is reduced by 50% in 2050.