International Resource Panel

OPERATIONALIZING NATURAL RESOURCE SCIENCE TO STRENGTHEN GLOBAL BIODIVERSITY

A follow-up opinion piece to Building Biodiversity

ACKNOWLEDGMENTS

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The authors of this piece would like to thank SYSTEMIQ (Rebecca Nohl, Julia Okatz) and the IRP Secretariat (Merlyn van Voore, Yi-Ann Chen) for their support in the development of this opinion piece, which directly follows up on the previous opinion piece, Building Biodiversity. They thank Carolyn Boyle for editorial support. They thank the SUN Institute Environment & Sustainability for its vital in-kind support. For his review and other valuable input, they also thank Sir Robert Watson.

Recommended citation: IRP (2022). Operationalizing natural resource science to strengthen global biodiversity (a follow-up to Building Biodiversity). Potočnik, J., Teixeira, I. An opinion piece of the International Resource Panel Co-Chairs.

Design and layout: Yi-Ann Chen (IRP Secretariat)

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A follow-up opinion piece to Building Biodiversity

Janez Potočnik and **Izabella Teixeira**
Co-Chairs of the International Resource Panel

SUMMARY OF SUGGESTED NEXT STEPS FOR LEADERS IN GOVERNMENT, CIVIL SOCIETY, SCIENCE, AND INDUSTRY

Human wellbeing is completely dependent on biodiversity and nature. We rely on it for our food, for clean air and water, for materials, and for the pharmaceuticals which keep us healthy. However, our human activities are causing biodiversity to decline at an unprecedented rate. Major drivers of biodiversity loss are all increasing, with natural resource use at their core. Habitat loss (primarily from expansion of agricultural and other biomass production) continues to rise, climate change is accelerating (driven by natural resource use including fossil fuel extraction), and pollution is damaging ecosystems (driven in large part by resource extraction).

Therefore, in their opinion piece Building Biodiversity,[1] the Co-Chairs of the UN International Resource Panel (IRP) propose four natural resource management principles for strengthening science-based action on biodiversity loss: **Know Your True Impact, Plan Together, Grow with Nature**, and **Value Nature** (summarized in Figure 1).

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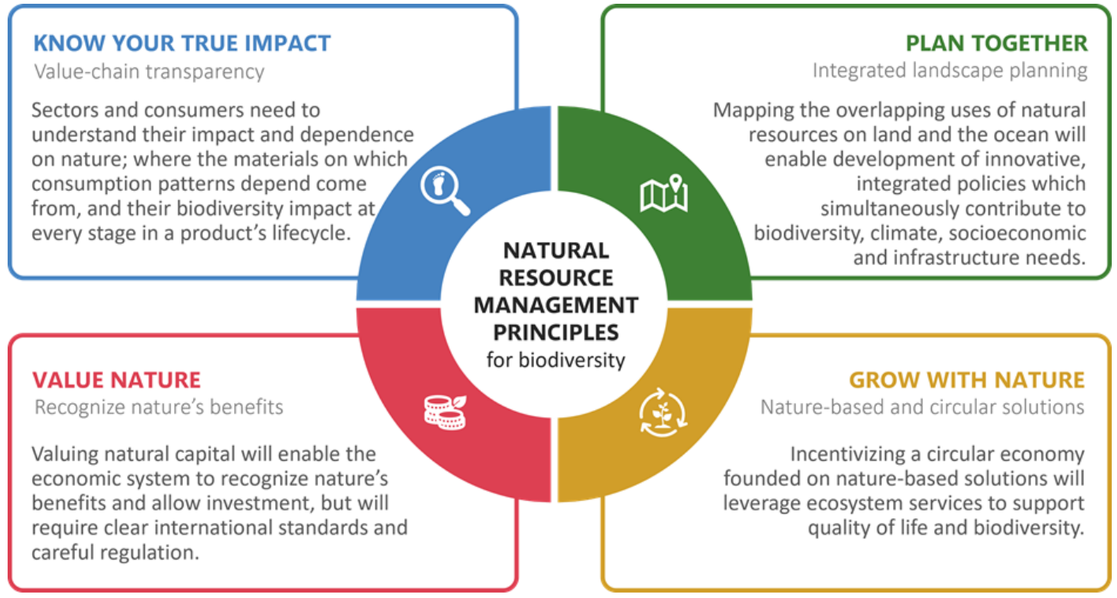


Figure 1. Natural resource management principles highlighted in the IRP co-chairs' opinion piece, Building Biodiversity.

Building on these principles, action to address the key drivers of biodiversity loss must be taken at upcoming global events – particularly the Convention on Biological Diversity's (CBD) 15th Conference of the Parties (COP15). A recent roundtable with leading figures from global nature and biodiversity institutions convened by the IRP concluded that governments, business and industry, the scientific community and civil society all have important roles to play. Guided by the IRP co-chairs' opinion piece, Building Biodiversity, and using IRP science, the IRP aims to support those showing great leadership in strengthening global biodiversity governance. The roundtable conclusions pointed to several key next steps in using natural resource science for effective global biodiversity governance and implementation, which are particularly relevant for CBD COP15.

1. IRP (2021) Building Biodiversity (https://www.resourcepanel.org/reports/building-biodiversity)

Guided by Principle 1, **Know your true impact**, advance globally coherent value chain transparency at the country and company levels to enable public and private investors to invest in sustainability along the value chain. **All relevant actors, including national governments and the business community, can commit to standardized global reporting based on a scientifically robust, user-friendly method for measuring the impact of national consumption on biodiversity.** Concretely, a science/policy convening organisation could bring together scientific experts and national government policy makers to work towards a method which could be utilised by governments and businesses alike. **The CBD could convene or be directly involved in this working group, to ensure that its outputs can feed directly into implementation processes**.

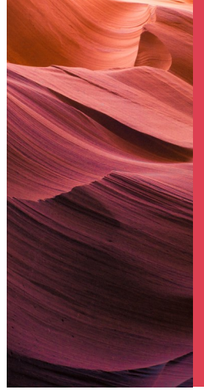
Guided by Principle 3, **Grow with nature**, advance the implementation of nature-positive production and nature-based solutions. To this end, **UNEP, together with sponsoring governments, could showcase best possible methods for demonstrating nature positivity in biomass production, as well as through climate finance, by hosting a space for leading actors from the scientific community**. The biodiversity governance community must ensure good biodiversity standards for production and natural climate solutions.

Guided by Principle 2, **Plan together**, actors need to make progress on integrated spatial planning and the mapping techniques needed to enable this. **As an action at CBD COP15, parties can commit to establishing internationally agreed science-based mapping standards and comprehensive, user-friendly tools**. To work towards this, the **UN Environment Programme (UNEP) and the CBD could jointly initiate a standing group, with technical and implementation expertise.** In the **longer-term**, this group could also **act as a support hub and aid capacity building, using the best scientific initiatives such as Nature Map and involving the expertise of UN science bodies such as the Intergovernmental Science -Policy Platform on Biodiversity and Ecosystem Services (IPBES) and the IRP.**

Guided by Principle 4, **Value nature**, move towards comprehensively recognizing nature's value in economic decision making. Overall decision-makers need to recognise the instrumental, relational, and intrinsic values of nature and biodiversity using economic (market and non-market values), social and biophysical indicators. One such option is through expanding the use of Inclusive wealth in decision making (it consists of the sums of produced, human, and natural capital). **At CBD COP15, UNEP and the CBD could identify leading countries and assess the potential for capacity building initiatives, by jointly convening countries with strong natural capital measurement capability to develop capacity building and knowledge transfer with others**. Working with others already developing capacity in this space, they could **build on existing progress and collaborate towards establishing a minimum standard for natural capital accounting data.**

All principles together can guide immediate action: for example, a blended **finance fund for nature positivity**, powered by deep transparency and science-based natural capital measurement. This blended finance solution could demonstrate the possibility of transforming a complex global value chain – for example, beef production – into something which ultimately improves natural capital, through shifts at every stage, including consumption. A public funder, such as a development bank, could join forces with a private innovation fund to de-risk and finance solutions for each stage of a specific value chain – connecting producers, processors, and consumers. Using comprehensive transparency tools, inclusive spatial planning, science-based indicators of nature positivity, and the best available natural capital valuation methods, the blended finance fund could invest in solutions turning around the most impactful practices along the value chain. These solutions might include beef producers leaving part of their land to nature and gaining revenue from tourism; beef feedstocks such as soy being channelled directly to plant-based products for human consumption; and leading food retailers directing consumers towards nature-positive products.

An integrated approach is needed to operationalize all four natural resource management principles and capitalize on synergies between them. Huge benefits to nature and people can be achieved with deep value chain transparency, thorough inclusive spatial planning, scientific nature-positivity standards, and comprehensive valuation of nature.



NATURAL RESOURCE SCIENCE CAN ENHANCE GLOBAL BIODIVERSITY GOVERNANCE

Biodiversity – the complex web of life on earth – is essential for human and planetary health. Humanity relies on it for food, water, protection from diseases and disasters, and so much more. Its destruction carries huge risks for economies and societies. While we acknowledge that nature's benefits are not adequately captured by existing economic metrics, it is striking to see economic organisations estimating that even with current market valuation, over half of global GDP is dependent on a healthy natural world.[2] Yet human activity is rapidly destroying biodiversity: species are currently being lost at 100-1,000 times the natural background rate.[3] Critical ecosystems are degrading, and some are being lost. The Amazon rainforest maintains the water cycle for much of South America and influences food production as far away as the US, but nearly one-fifth of its area has been lost in the last 50 years alone.[4] The most important drivers of the biodiversity crisis are consumption patterns and the natural resource use on which they rely: according to IRP's 2019 Global Resources Outlook, natural resource use causes 90% of global land-related biodiversity loss, mainly due to agriculture and timber production.[5] It has been acknowledged that halting and reversing biodiversity loss will be impossible without changing consumption and production patterns.[6,7]

So far, efforts to halt and reverse this massive loss of nature have been unsuccessful. In 2010, governments from around the world came together to agree on the Aichi biodiversity targets, which aimed to keep natural resource use within safe limits.[8] However, in the decade since, indicators for only a few of these targets are moving in the right direction.[9] The Aichi targets were negotiated by the co-chairs of the IRP, Janez Potocnik and Izabella Teixeira, the respective leaders of the European Commission and Brazilian delegations. The next global biodiversity framework and targets will be finalized at CBD COP15 in 2022.

To strategize on how natural resource management principles can be operationalized in global biodiversity governance, the IRP brought together leaders in policy, economics, science, and advocacy to reflect on concrete steps to realize the principles. Roundtable experts concluded that this objective would be significantly aided by changes in the broader landscape, including connecting different global agendas (e.g., biodiversity, climate, and health, and all the SDGs); designing solutions that incorporate inter-regional cooperation; channelling finance towards nature positivity; and mobilizing the business community's willingness to make a difference. The group aligned around the need to set the narrative for biodiversity, making it clear that healthy ecosystems are core to economic activity and societal stability. Biodiversity is an environment, development, economic, social, security, moral and ethical issue and impacts all of the SDGs.

Action by multiple governance bodies is needed to address the direct and indirect drivers of biodiversity loss

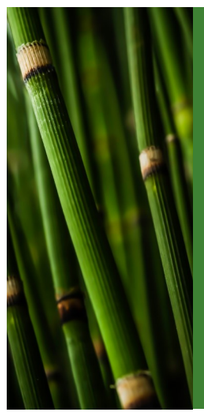
IPBES identifies five major drivers of biodiversity loss: land and sea use change, direct exploitation (such as overfishing), climate change, pollution, and invasive alien species.[10] Natural resource use is at the root of almost all of these: land use is a natural resource, so land use is natural resource use; natural resource use drives a significant proportion of global climate change impacts (through fossil fuel extraction, for example); pollution is driven by extraction and processing of natural resources; biomass is a natural resource, so direct exploitation of biodiversity is also natural resource use. Therefore, the way natural resources (land, water, fossil fuels, metals, minerals, and biomass) are managed, is absolutely crucial to tackling biodiversity loss.

Targets on biodiversity itself, set through CBD, and their implementation, are of paramount importance. Action from other UN conventions setting global targets for other drivers of biodiversity loss is also needed. For example: the UN Framework Convention on Climate Change (UNFCCC) has a duty to ensure climate change as a driver of nature loss is reduced. UNFCCC is already harnessing the power of biodiversity as a climate solution by ramping up its focus on nature-based solutions. The UN Convention to Combat Desertification (UNCCD) has a crucial role to play in maintaining habitat for biodiversity by preventing land degradation, and restoring degraded landscapes. Natural resource management solutions can contribute to actions across these conventions, with the ultimate aim of halting and reversing nature loss.

2. www3.weforum.org/docs/WEF_New_Nature_Economy_Report_2020.pdf.
3. IPBES (2019), Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.(https://ipbes.net/sites/default/files/inline/files/ipbes_global_assessment_report_summary_for_policymakers.pdf)
4. www.science.org/doi/10.1126/sciadv.aba2949.
5. IRP (2019) Global Resources Outlook (www.resourcepanel.org/reports/global-resources-outlook).
6. Leclère et al (2020) (https://www.nature.com/articles/s41586-020-2705-y)
7. Ellen MacArthur Foundation (2021) (https://emf.thirdlight.com/link/bqgxl2mlprld-v7i2m6/@/#id=0)
8. www.cbd.int/sp/targets.
9. UNEP (2020), Making Peace with Nature (Figure 3.2) (https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/34948/MPN.pdf)
10. IPBES (2019), Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.(https://ipbes.net/sites/default/files/inline/files/ipbes_global_assessment_report_summary_for_policymakers.pdf)

Figure 2. The current landscape for resource-science based governance, and ambition and concrete actions for COP15.

Natural resource management principles for biodiversity governance	Status quo: Promising developments: CBD targets and relevant initiatives	Status quo: Remaining gaps	Propositions inspired by IRP Building Biodiversity Think Piece and high level Roundtable: Proposed ambition to be set at COP15	Propositions inspired by IRP Building Biodiversity Think Piece and high level Roundtable: Suggested concrete actions to be taken at COP15
Know your impact	• Post 2020 GBF targets 5, 7, 9, 16 • Initiatives operationalising nature-related transparency, such as TNFD. • Developing value chain transparency tools, such as Trase.	• No internationally agreed value chain transparency method, leading to lack of accountability and uneven playing field for business.	• Commit to agreeing an impact footprinting standard to enable strong value chain transparency.	• Work towards clear biodiversity footprinting methods. • New cross-country stakeholder coalition to finance and innovate whole value chains to deliver nature goals.
Plan together	• Post 2020 GBF targets 1, 2, 3, 8, 12, 21. • Mapping tools and techniques for biodiversity rapidly developing, such as Nature Map.	• Only 15% National Biodiversity Action Plans include spatial information for guiding action on CBD targets. • Decision makers are not using shared spatial information.	• Commit to creating scientific mapping standards, enabling inclusive spatial planning. • Commit to ensuring all countries have capacity to use standards developed.	• Work towards science-based mapping standards, and user-friendly tools. • Establish a support-hub and aid capacity building, using the best scientific initiatives and UN expertise.
Grow with nature	• Post 2020 GBF targets 4 and 9. • Schemes rewarding nature-positive production are increasing, such as the UK's Environmental Land Management Scheme.	• No internationally agreed definition of nature-positivity. • Nature is not yet core to most of the world's agricultural subsidies or strategies.	• Commit to developing a scientific definition of nature-positivity, enabling clarity for policymakers, producers and investors.	• Science community showcase best possible methods for demonstrating nature positivity in production and carbon offsetting. • Initiate work towards agreed nature-positivity indicators and standards.
Value nature	• Post 2020 GBF targets 14, 18, and 19. • Adoption of UNSEEA. • Central banks beginning to recognise nature's value, such as Netherlands and Norway.	• Economic decisions not incentivising nature's protection. • Limited global capacity for natural capital accounting.	• Commit to building natural capital accounting capacity, enabling governments to factor nature into economic decisions.	• Countries with strong natural capital accounting capability commit to capacity building with others. • Public and private sector actors commit to jointly financing nature and ecosystem services.



CONCRETE ACTION TO IMPLEMENT THE IRP'S FOUR NATURAL RESOURCE MANAGEMENT PRINCIPLES

The roundtable discussion suggested key elements for operationalizing the four natural resource principles, which can be translated into concrete next steps at important decision moments – especially the upcoming CBD COP15. All stakeholders can play a role, from government leaders to industry.

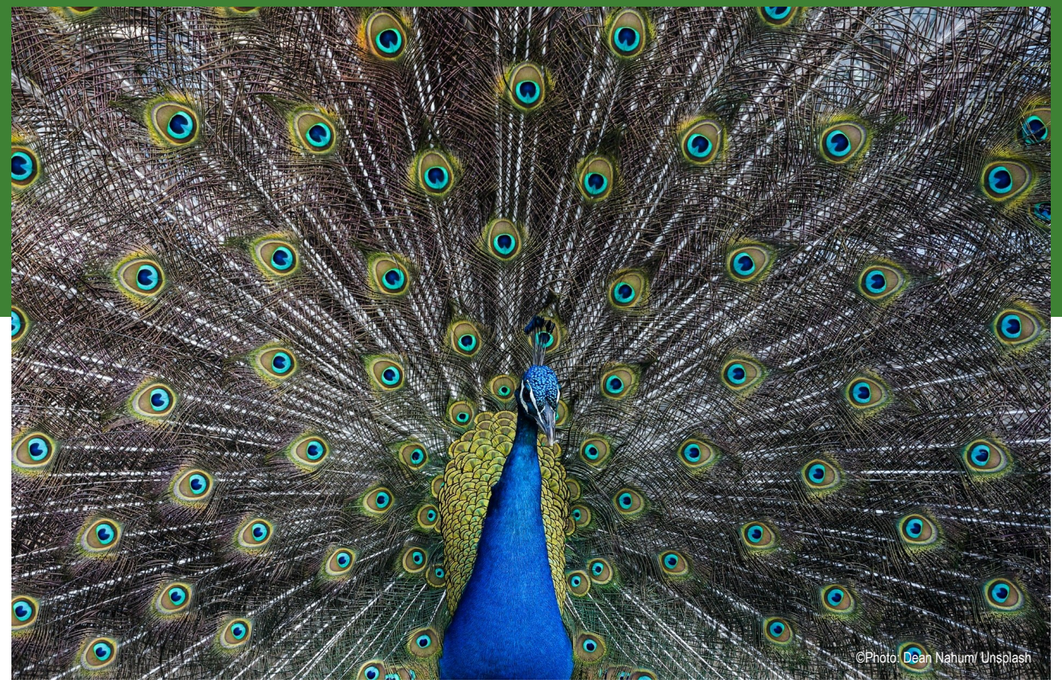
PRINCIPLE 1

KNOW YOUR TRUE IMPACT AND ACT ON DRIVERS THROUGHOUT THE VALUE CHAIN

Knowing the true impact of economic activity on biodiversity is crucial for managing the drivers of nature loss. This means knowing where, when, and how activities in a value chain impact on nature – from resource extraction through processing, transportation and product use to waste and disposal. High-quality transparency will enable decision makers to identify the points in the value chain at which actions can make the biggest difference, ultimately resulting in biodiversity-positive products.

To make economic activities nature positive, all sectors, policy makers and consumers must act on the same type of information, gathered in the same way. Ideally, a country's total biodiversity impact would be calculated by adding up the impacts of all value chains of its consumption, no matter where in the world activities in the value chain took place. However, at present, there is no standard method for governments to report on the total cross-border biodiversity impact of their consumption. Often, reporting under existing multilateral environmental agreements (e.g., the Aichi Biodiversity Targets) only includes activity within national borders – thus masking much of the true impact of a country's consumption.[11] It is essential that biodiversity impact reporting goes beyond domestic activity, because consumption in certain parts of the world (primarily high-income countries) is driving significant biodiversity impact elsewhere – especially in biodiversity-rich countries, which are often low income.

There are different methods of tracking impact throughout value chains. For example, impact footprint methods assess the changes in key drivers (e.g., land use change, which causes habit loss) caused by each activity in a value chain, no matter where that activity takes place.[12] At present, impact footprint methods can track the climate change, land use change, water stress and air quality impacts of material use in value chains, but not detailed impacts on biodiversity. By knowing how much land use change is caused by each step in a value chain, scientists can go one step further and link to biodiversity outcomes, applying knowledge of how value chain activities cause drivers such as land use change or pollution, and estimating the degree to which specific species are impacted. Of course, this method is not perfect and could be improved with more accurate knowledge of species locations and ecosystem intactness; but it is a promising tool for global governance to use in biodiversity target implementation. The advantage of this method is that it combines final demand (which could encompass all consumption taking place within a country) with sectoral activities. It could thus be used by governments and businesses alike: a country's total impact would be the cumulative sectoral impacts which its consumption drives.



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Proposed targets in the CBD's draft global biodiversity framework already highlight the importance of knowing your true impact (including targets 5, 7, 9, and 16). Targets cover the need for sustainable and legal trade, sustainable waste management and pollution reduction, and responsible consumption – all of which rely on value chain transparency.[13] However, countries will need to upscale their reporting: no current national biodiversity strategy or action plan explicitly mentions "supply/value chain transparency" or even "supply/value chain impact",[14] let alone concrete methods for coherent reporting on a global basis.

Attendees of the IRP's high-level roundtable agreed that this type of robust, standardized, science-based measurement will be essential for the implementation of new global biodiversity targets. Global value chains are complex, and sites of biodiversity loss caused

by production are often far removed from sites of consumption. Encouragingly, user-friendly tools to make sense of value chain impact are developing, one example is Trase, developed by the Stockholm Environment Institute (SEI).[15] To capture this complexity in managing the drivers of nature loss, international agreement on science-based impact measurement will be necessary. Businesses are often eager to report and act on their biodiversity impact but are confused about exactly how to do so – making it even more important for global governance to provide clarity.

Including impact on nature in mandatory supply chain due diligence has become an increasing priority for governments. For example, the UK's latest Environment Bill will introduce strong due diligence to confirm that agricultural commodities imported into the UK are free from illegal deforestation;[16] while the EU has consulted on making supply chains completely deforestation free.[17] Initiatives like the developing Taskforce on Nature-related Financial Disclosures (TNFD) will also encourage companies to disclosure their impact and dependence on nature, new guidance is already aiding biodiversity-related disclosure.[18] Although such progress is encouraging, the development of national standards by individual governments could result in a confusing landscape for exporters.

Standardized global reporting, based on a robust scientific impact measurement, would facilitate the identification of hotspots driving biodiversity impact, such as meat consumption in certain countries. This kind of holistic information would enable more cooperative solutions, such as producer and consumer countries working together to address drivers across borders by innovating several steps of the value chain at the same time, including by supporting business model change and upgrading producer livelihoods.

For example, seed funding could be applied to solutions that connect consumers to producers. By identifying impact hotspots, governments and businesses could work together to finance and scale up innovative solutions, providing alternatives to both consumption and production patterns that cause these hotspots.

The Blended Finance Taskforce offers many examples of how seed funding from public money has mobilized significant private capital for sustainable food production in Brazil – home to some of the world's richest biodiversity, as well as sites of high-impact production.[19] Examples include restoring degraded forests through agroforestry producing cocoa; improving grassland species richness through integrating crop and livestock production; and sourcing Brazil nuts from indigenous communities.

All actors have roles to play in moving towards international agreement on how to provide standardized transparency on impact throughout value chains, from production to consumption. The scientific community can seek to fill gaps in existing methodologies to ensure that the impact on nature is properly accounted for – looking beyond proxies such as land use and biomass and including measures of ecosystem intactness and impact on particular species. Another crucial task is to link specific value chain activities to specific impacts and thus identify the practices which must change. This is by no means simple; but it is achievable if diverse scientific groups come together with a clear mandate from the global governance community.

The business community can mobilize action from global governance and individual governments, both by stating the need for quality measurement and by financially supporting development efforts.

At COP15, countries should commit to agreeing on a standard science-based method for measuring the impact of consumption on biodiversity, underpinning global value chain transparency. This could be used by governments and businesses alike and could feed into official CBD target implementation. Actions from multiple actor groups can play a role in reaching this agreement, acknowledging that COP15 will be just the start of the journey. As a first step, a convening organisation could bring together scientific experts and national government policy makers to work towards a scientifically robust, user-friendly method for measuring the impact of national consumption on biodiversity.

Business and finance should demonstrate their willingness to act on biodiversity loss and highlight examples of best practice. Ahead of COP15, a business convening organization could bring businesses and government ministers together to discuss the practical need for an impact measurement standard and inspire the global governance community as to what becomes possible with quality value-chain transparency – such as case studies of how improved knowledge has led to the removal of deforestation drivers.


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11. www.theccc.org.uk/publication/2021-progress-report-to-parliament.
12. www.sciencedirect.com/science/article/pii/S0048969719319850.
13. www.cbd.int/doc/c/abb5/591f/2e46096d3f0330b08ce87a45/wg2020-03-03-en.pdf.
14. www.cbd.int/doc/nbsap/Google%20Keyword%20Search.pdf.
15. https://www.trase.earth/
16. https://bills.parliament.uk/publications/42717/documents/683 (use of forest risk commodities in commercial activity).
17. https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12137-Deforestation-and-forest-degradation-reducing-the-impact-of-products-placed-on-the-EU-market_en.
18. https://www.cdsb.net/biodiversity
19. https://www.blendedfinance.earth/better-food-better-brazil

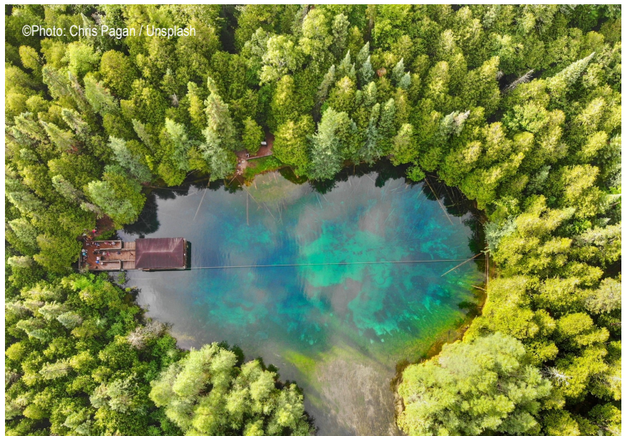
PRINCIPLE 2

PLAN TOGETHER

The second principle is essentially about integrated spatial planning: assessing natural resource demand across actors and sectors, minimizing the risk of conflict, and maximizing the potential for co-benefits. Accurate spatial information on all competing demands on an area, as well its biodiversity and carbon capture and storage potential, can inform solutions that benefit all parties – such as food production systems which simultaneously provide protein, habitat for wildlife and carbon sequestration.[20, 21]

Expert attendees of the IRP's high-level roundtable agreed that mainstreaming biodiversity in national decision making would require all ministries within national governments, and governments of different countries to act together.[22] To this end, it will be essential to map all uses of space, together with nature and carbon capture potentials. All ministries within a government should use common open access spatial information. For example, the housing, transport, and agriculture ministries should all be able to see each other's demand for space. Landscape plans with all human needs and environmental assets will enable different actors, such as diverse government ministries, to see where their priorities align and where they differ. The use of shared information makes it easier to view all needs against the available natural resources and arrive at solutions which avoid negative outcomes for anyone, as well as for climate and nature, as much as possible. If solutions focus narrowly on individual problems, unintended consequences will arise. Biofuel as a climate solution is one example: it is a prominent feature in climate models, but it could lead to negative outcomes for biodiversity because it requires so much land area.[23] By considering all needs, integrated spatial planning seeks to avoid narrow solutions and their unintended consequences. This would enable transformative science-based land use planning, targeting biodiversity conservation efforts effectively and delivering multiple benefits simultaneously (e.g., flood protection and nature-positive production in the same area of land). Currently, different ministries are often not operating from shared spatial information, this needs to change for these benefits to be realized.

Spatial planning is captured by several targets in the draft Global Biodiversity Framework (including targets 1, 2, 3, 8, 12, and 21). A key target for the next Global Biodiversity Framework is the aim of conserving 30% of land and sea for biodiversity by 2030. Integrated spatial planning will be crucial to achieve this without trade-offs. The need for spatial planning is recognized by the draft post-2020 targets: the very first target aims to ensure that biodiversity in the remaining 70% of land and sea is managed sustainably while delivering benefits to people: "all land and sea areas globally are under integrated biodiversity-inclusive spatial planning addressing land- and sea-use change, retaining existing intact and wilderness areas." Therefore, spatial contributions must be part of national planning on biodiversity. However, only 15% of the national biodiversity strategy action plans for meeting CBD targets include spatial information for guiding action on nature; so, there is real room for improvement here.[24]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Encouragingly, there are promising scientific initiatives to build upon. Nature Map has developed an integrated global map of biodiversity, carbon storage and clean water supply, with the aim of supporting national decision making.[25] The first local applications of Nature Map have started in Argentina and Mexico, supporting enhanced protection for forests and biodiversity.[26] This kind of information will enable the financing and implementation of effective conservation efforts and nature-based solutions.

As with Principle 1, *Know your impact*, internationally agreed standards are essential to ensure that decisions on the use of space are based on top-quality evidence.


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At CBD COP15, UNEP and the CBD could jointly commit to developing internationally agreed mapping standards, based on the best possible science, and to build capacity to implement inclusive spatial planning as widely as possible. This could be initiated at COP15 through bringing together ambitious governments, and technical and implementation experts in a standing group, working towards science-based mapping standards and comprehensive, user-friendly tools. This group could also act as a support hub and aid capacity building, using the best scientific initiatives such as Nature Map, and involving the expertise of UN science bodies such as IPBES and the IRP.

20. https://irp.cdn-website.com/be6d1d56/files/uploaded/211026%20Integration%20of%20nature%20and%20climate%20brief_Final-v2_uxxYagdxSXGadGMEuTJA.pdf
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25. https://naturemap.earth/.
26. https://naturemap.earth/about/.

PRINCIPLE 3

GROW WITH NATURE

Over the last few decades, booming food and material production has increasingly relied on mechanization and chemical inputs (e.g., fertilizers and pesticides).[27] The intensive use of these inputs has pushed the planetary boundary on biogeochemical flows far beyond safe limits.[28] Principle 3, *Grow with nature*, is all about scaling up production practices which deliver both for people and for biodiversity. This also applies to nature-based solutions for the climate crisis – for example, while natural carbon capture can deliver huge climate benefits,[29] it also needs to meaningfully enhance biodiversity. Any action to address one environmental crisis (climate change, biodiversity, or pollution) should be net positive for others; unintended consequences need to be avoided.

Scaling nature-positive production and carbon capture is already proven to support sustainable livelihoods, providing long-term security to those who depend on them. For example, the Ellen MacArthur Foundation highlight biodiversity-positive circular business opportunities from eliminating waste and pollution, keeping materials and products in use, and regenerating natural systems.[30] Linking to Principle 1, enhanced value chain transparency can facilitate the identification of impact hotspots where it is particularly important to shift to nature-positive livelihood creation.

However, certain gaps mean that it is not yet possible to realize the full potential of nature-positive production and natural carbon capture solutions. For example, the very concept of 'nature-positive production' has not been quantitatively defined. To be classed as truly 'nature-positive', production would ideally need to achieve specific outcomes for species and for the delivery of ecosystem services such as pollination or air and water purification. Social and economic objectives also need to be considered: there are context-dependent cost implications of different strategies to improve ecosystem service delivery.[31] This kind of internationally agreed standard would make it easier to channel finance towards genuinely nature-positive practices and avoid mere attempts at "green-washing".

Productive sectors are a key part of the solution to enhance global biodiversity, and this is captured by targets in the draft post-2020 framework (including targets 4 and 9). Draft targets include ensuring livelihoods through sustainable management of species and natural resources; and enhancing the benefits that nature delivers to people, including regulation of air and water quality. As food production accounts for significant uses of terrestrial and marine biodiversity, changes in this sector will be key to achieving these targets. As land use change is the major driver of biodiversity loss, agriculture must become central to biodiversity protection and regeneration solutions, just as the energy sector has become central to climate action.

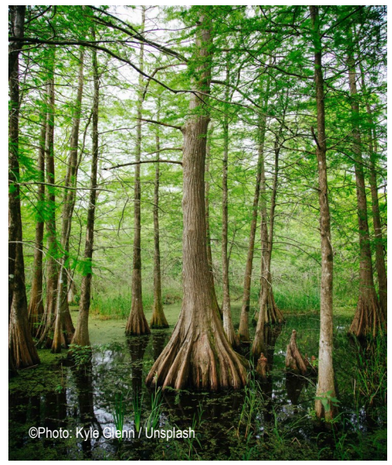
Agricultural businesses have a crucial role to play but will need clarity and support from governments. Governments can incentivize nature-positive production by defining clear, user-friendly standards and channelling finances to producers that meet them. Encouragingly, schemes that reward nature-positive production are increasing. One example is the UK's Environmental Land Management Scheme, which financially rewards producers that deliver ecosystem services.[32]

Internationally agreed nature-positivity standards for production and carbon capture would facilitate financial flows globally: biodiversity-rich producer countries stand to benefit from finance that rewards production while also bending the curve on biodiversity loss. The economic opportunities are substantial: production which restores degraded landscapes is already generating new livelihoods around the world. Modelling also suggests that more jobs are created by COVID-19 recovery investments which focus on nature-based solutions, rather than on business as usual, however, we are yet to see countries putting these investments into practice on a large scale.[33]

International bodies should be mindful that nature-positive production needs responsible and effective governance – including, as mentioned above, robust definitions of what 'nature positivity' looks like on the ground. This applies to climate solutions as well as agricultural production. Establishing such a standard would ensure that nature-based carbon offsets are genuinely nature positive, delivering greater co-benefits, avoiding trade-offs, and inspiring confidence among offset investors. Ideally, it would also acknowledge economic and social considerations.

Given that many further questions on legitimizing and optimizing carbon offsetting remain to be clarified by the climate community, the biodiversity governance community must provide solid biodiversity standards for carbon offsets (noting that biodiversity offsets – for example, for infrastructure development – are a separate question).

To progress on implementing nature-positive production, CBD COP15 can commit to developing a science-based definition of nature-positivity. This would give much needed clarity to governments, producers, and investors. As a first step towards this at CBD COP15, UNEP, together with a sponsoring government, could host a space for the scientific community to showcase best possible methods for demonstrating nature positivity in production, as well as carbon offsetting. Leading producers could demonstrate inspiring examples of nature-positive value creation.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PRINCIPLE 4

VALUE NATURE

Our economic systems must recognize nature's true value, including the ecosystem services it provides. *Valuing nature* means accounting for the benefits it affords. Our systems should incentivize long-term investment in nature, rather than rewarding its destruction. Humanity relies on nature for planetary and economic stability. Economic decision makers should thus factor nature into all their choices – for example, it should be considered in cost-benefit analysis of housing and infrastructure development.

Economic incentives need to shift. Currently, market signals (i.e., the prices assigned to goods and services) tell economic actors (including businesses, decision makers and consumers) that nature is worth more when it is converted into goods for human use. For example, a tree has no quantified economic value until it is chopped down for timber. Economic systems do not factor in the value that nature gives us when it is left to perform its essential functions of regulating the climate, providing clean air and water, and protecting against natural disasters. By treating nature in this way, economic decision makers and consumers are acting in short-term interests only and are putting long-term stability at risk.

This needs to change. Decision makers need to take these services into account; otherwise, economic, and societal stability are threatened. Changing the signals that consumers receive would make a real difference to consumption patterns: if alternative proteins were completely appealing for meat-eaters, and consistently cheaper than meat, consumers would more easily replace resource-intensive products with nature-positive options.


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Several draft CBD targets state the need to incorporate the value of nature into decision making at all levels of government. Seven draft targets are captured under the category of "Tools and solutions for mainstreaming", including the need to redirect financial flows away from activities which harm nature towards the conservation and sustainable use of nature.

If governments are serious about protecting biodiversity, they should incorporate nature as an asset when defining economic success.[34] This requires that "natural capital" – in other words, ecosystem extent and quality – be measured; and that these natural assets be valued in national accounts. The Dasgupta Review (2021) advocated that economic policy-makers move towards using Inclusive Wealth, with its focus on stocks of produced, human, and natural capital, as a central tool in decision-making. There have been promising developments in this regard: the UN System of Environmental Economic Accounting (UNSEEA)[35] was approved as an internationally accepted statistical standard in 2021, although capacity for its implementation remains deeply uneven. Therefore, capacity building – upscaling natural capital accounting capability around the world – is essential. Low-income, biodiversity-rich countries could financially benefit from global recognition of the importance of their natural assets, and employment opportunities could be created in conservation and ecosystem monitoring.

Another encouraging development is the recognition of nature's value by central banks: the Dutch Central Bank was the first to highlight the loss of biodiversity as a material financial risk in 2020.[36] Norges Bank, the world's largest sovereign wealth fund, recently published its expectations of how companies it invests in should treat biodiversity and ecosystems: expectations include integrating nature-related risks into risk management, disclosing nature-related dependencies, and reporting associated metrics and targets.[37]

At COP 15, countries with strong natural capital measurement capability should commit to capacity building with others and work towards the establishment of a minimum standard for natural capital accounting data. Private sector and government actors can jointly commit to financing initiatives that reward stewardship of ecosystem intactness, through mechanisms such as payments for ecosystem services (PES). This relates to Principles 1 and 3, Knowing your impact and Grow with nature: investing in PES schemes can reduce the impact of production on biodiversity and create sustainable livelihoods.[38]

34. Dasgupta (2021), The Economics of Biodiversity: The Dasgupta Review (https://www.gov.uk/government/publications/final-report-the-economics-of-biodiversity-the-dasgupta-review)
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ALL PRINCIPLES CAN IMMEDIATELY ENABLE INNOVATIVE INVESTMENT SOLUTIONS

All principles can come together to inform investment solutions and could for instance materialise through the creation of a fund with the aim to enhance natural capital through investing in nature-positive production. This would be a concrete way to implement all four principles, and could be initiated immediately, in advance of international agreement on standards. This kind of initiative can powerfully demonstrate the huge benefits to nature and people which can be achieved with deep value chain transparency, thorough inclusive spatial planning, scientific nature-positivity standards, and comprehensive valuation of nature. In turn, this will build momentum for international agreement which enables these solutions to be implemented at scale. A similar approach has already been initiated by UNCCD.[39] Given the novelty of the approach and the recognition that investible sustainable solutions are not always found off the shelf, this fund could be structured as a blended finance one, where public capital would subsidise pipeline building and technical assistance, and de-risk investments from private investors.


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Deep transparency on biodiversity impact, based in the best available science, would enable investors to pinpoint hotspots in the value chain where changing practices would make the greatest difference. A key characteristic of the fund would be that it financed alternatives to practices which harm nature. It could provide start-up capital for producers to diversify their revenue streams. Looking across the value chain, it could also guide prioritising the lowest impact processing and distribution techniques, in turn opening sustainable job opportunities for employees in these sectors.

Developing alternative revenues for producers will be hugely aided by integrated spatial planning, which would help to optimize the benefits from freeing land for nature. The principle of Growing with nature will also guide investment in production: which production techniques deliver multiple ecosystem services simultaneously? Which products can be developed which improve the efficiency of our biomass use? For example, channelling animal feedstock such as soy directly to human consumption through plant-based meat-substitute protein products.

The principle of *Valuing nature* would underpin the fund's overall objective: improving the quality and quantity of natural capital which is currently impacted by specific value chains. To measure the success of this objective, the best available natural capital measurement and valuation tools would need to be employed. Demonstrating an overall increase in natural capital because of the fund's investments would be a powerful proof of concept, paving the way for scaling similar solutions.

Scaling such solutions will rely on clarity from global governance, giving investors and all other value chain actors the security they need, and ensuring a level playing field. Lack of harmonization in standards is already identified as a major barrier for ESG investing; the role of global governance in removing this barrier is crucial.[40]

39. https://www.unccd.int/actions/impact-investment-fund-land-degradation-neutrality
40. Dasgupta (2021), The Economics of Biodiversity, The Dasgupta Review (Chapter 20)

Figure 3. Natural resource science can guide investment solutions, making value chains nature positive. Scaling these solutions will rely on global governance, giving clarity to investors and actors along the value chain. (Adapted from the Food and Land Use Coalition (FOLU), (2019))

CLARITY FROM GLOBAL GOVERNANCE IS ESSENTIAL FOR OPERATIONALIZING ALL PRINCIPLES

An integrated approach is needed to operationalize all four natural resource management principles and capitalize on synergies between them, for solutions including the blended finance fund and beyond. For example, Principles 1 and 4, *Know your impact* and Value *nature*, will both be aided by the development of strong mapping techniques based on the best science.

In this article, we have summarized several ways in which the natural resource management principles can be integrated into the next set of targets. However, there are many more ways in which this agenda can be advanced by multiple actors. There are livelihoods to be created; economic opportunities to be realized; innovative food products to be developed; and climate solutions to be implemented. All these initiatives will be much more streamlined and effective if global governance provides clarity on key questions.

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