






Enabling transformative economic change in the post-2020 biodiversity agenda

Esther Turnhout¹  | Pamela McElwee²  | Mireille Chiroleu-Assouline³  |
 Jennifer Clapp⁴ | Cindy Isenhour⁵ | Eszter Kelemen^{6,7}  | Tim Jackson⁸ |
 Daniel C. Miller⁹  | Graciela M. Rusch¹⁰ | Joachim H. Spangenberg¹¹ |
 Anthony Waldron^{12,13}

¹ Wageningen University, Wageningen, the Netherlands

² Department of Human Ecology, Rutgers University, New Brunswick, New Jersey, USA

³ Paris School of Economics, University Paris 1 Panthéon Sorbonne, Paris, France

⁴ School of Environment, Resources and Sustainability, University of Waterloo, Ontario, Canada

⁵ Department of Anthropology/Climate Change Institute, University of Maine, Orono, Maine, USA

⁶ Environmental Social Science Research Group (ESSRG), Budapest, Hungary

⁷ Centre for Social Sciences, Institute for Sociology, Budapest, Hungary

⁸ Center for the Understanding of Sustainable Prosperity, University of Surrey, Surrey, UK

⁹ Department of Natural Resources and Environmental Sciences, University of Illinois at Urbana-Champaign, Urbana, Illinois, USA

¹⁰ Norwegian Institute for Nature Research (NINA), Trondheim, Norway

¹¹ Sustainable Europe Research Institute SERI Germany, Cologne, Germany

¹² Cambridge Conservation Initiative, Cambridge University, Cambridge, UK

¹³ The Working Ant, Cambridge, UK

Correspondence

Esther Turnhout, Department of Environmental Sciences, Wageningen University, PO Box 47, 6700 AA Wageningen, the Netherlands.

Email: esther.turnhout@wur.nl

Abstract

The COVID-19 pandemic, its impact on the global economy, and current delays in the negotiation of the post-2020 global biodiversity agenda of the Convention on Biological Diversity heighten the urgency to build back better for biodiversity, sustainability, and well-being. In 2019, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) concluded that addressing biodiversity loss requires a transformative change of the global economic system. Drawing on the IPBES findings, this policy perspective discusses actions in four priority areas to inform the post-2020 agenda: (1) Increasing funding for conservation; (2) redirecting incentives for sustainability; (3) creating an enabling regulatory environment; and (4) reforming metrics to assess biodiversity impacts and progress toward sustainable and just goals. As the COVID-19 pandemic has made clear, and the negotiations for the post-2020 agenda have emphasized, governments are indispensable in guiding economic systems and

This is an open access article under the terms of the [Creative Commons Attribution](https://creativecommons.org/licenses/by/4.0/) License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2021 The Authors. Conservation Letters published by Wiley Periodicals LLC

must take an active role in transformations, along with businesses and civil society. These key actors must work together to implement actions that combine short-term impacts with structural change to shift economic systems away from a fixation with growth toward human and ecological well-being. The four priority areas discussed here provide opportunities for the post-2020 agenda to do so.

KEYWORDS

biodiversity conservation, economic systems, green finance, incentives, metrics, policy, regulation, subsidies, trade, transformative change

1 | INTRODUCTION

The COVID-19 pandemic has slowed discussions on the post-2020 biodiversity agenda, with the 15th Conference of the Parties (CoP) to the Convention on Biological Diversity now delayed to the end of 2021. The current “zero draft” of the post-2020 global biodiversity framework (CBD, 2020a), which will be negotiated at the CoP, draws on the 2019 Intergovernmental Panel for Biodiversity and Ecosystem Services Global Assessment (IPBES, 2019) in recognizing the importance of transformative change to safeguard nature and its contributions to people. For example, the draft notes that “urgent policy action globally, regionally, and nationally is required to transform economic, social and financial models so that the trends that have exacerbated biodiversity loss will stabilize in the next 10 years.” (CBD, 2020a, p. 2) Yet it remains vague with regard to how such transformations might be achieved. Moreover, although it identifies a number of goals and targets related to economics and biodiversity funding, it fails to specify a coherent strategy to transform underlying economic and financial systems and structures that drive the destruction of biodiversity (CBD, 2020a).

A specific, actionable strategy is urgently needed since the drivers of biodiversity loss have grown dramatically in the past decades and are only expected to increase in scope and intensity (IPBES, 2019). Our current economic system has achieved a quadrupling of global GDP over the past 50 years (Otero et al., 2020). However, this remarkable growth has come at the cost of widespread biodiversity loss and marked increases in greenhouse emissions (IPBES, 2019; Otero et al., 2020), while simultaneously generating a highly unequal distribution of benefits (Jackson, 2017). These changes threaten not only nature and human well-being but also future economic prosperity, leading the World Economic Forum to rank environmental and biodiversity degradation in the top five global economic risks today, even prior to the COVID-19 pandemic (WEF, 2020). The business community is increasingly recognizing the

threat posed by degradation of nature, including loss of pollinators, depleted water supplies, and increased risks of natural disasters.

The COVID-19 crisis provides further impetus to rethink the draft post-2020 biodiversity framework and prioritize strategic actions leading to transformative change in the way our economies and governance systems work. The COVID-19 crisis has shown in stark relief that financial and market tools, regulation, and voluntary measures must be used together, not separately. Governments have used financial stimuli to keep the economy from collapsing and to support those made jobless, and they have put in place regulations to spur behavioral change since voluntary actions, such as mask-wearing, alone proved to be insufficient. COVID-19 also clearly demonstrated how individual decision-making is structured by both government and market forces together, which affected among others the capacity of individuals to follow stay-at-home orders. Preventing potentially catastrophic outcomes from biodiversity loss will require the same approach: A recognition that the economy is the result of public institutions and the market working in tandem; that individual actions are embedded within these structural factors; and therefore, that promoting pro-biodiversity actions requires the transformation of those structural factors to create an appropriate enabling environment.

The integrated approach needed to improve biodiversity and climate outcomes will require radically changing the current imbalance between policies and market demands that promote biodiversity-damaging activities and those that promote biodiversity-conserving and enhancing activities. Yet, recognition of these critical interactions among governments, markets, and individuals—and related actions to address them—is largely absent in the current zero draft’s theory of change.

Here, we draw on the results of the IPBES global assessment to identify actions that can enable transformative change in national and global economic systems. We identify four priority areas for these actions: (1) Increasing

capital investment in nature conservation and biodiversity-enhancing production; (2) redirecting economic incentives away from damaging activities and towards nature-enhancing actions; (3) creating enabling regulatory frameworks to ensure the effectiveness of increased investments and realigned incentives; and (4) reforming metrics to measure, value, and catalyze these transformative shifts and their impacts on human and ecological well-being. Although these four priority areas involve actions that have been proposed previously, we foreground the need for a more holistic strategy that combines concrete measures with structural changes. Profound transformative change will only be possible with the market, state, and civil society actors working together on these priority areas simultaneously.

2 | INCREASED FINANCING FOR CONSERVATION

Finance (capital investment) is the first economic requirement of both productive enterprises and biodiversity conservation. In contrast to the ambitions articulated in Aichi Target 20, and in the zero draft Target 18 goals currently in discussion, the finance committed to public-goods-style biodiversity conservation (e.g., protected areas) is highly inadequate, leading to biodiversity loss through simple ineffectiveness (Coad et al., 2019; Waldron et al., 2020). The financing needed for post-2020 biodiversity agendas is at least \$151 billion annually and may be as high as \$895 billion annually (CBD, 2020b). An earlier forensic analysis of biodiversity spending found that annual conservation budgets were approximately \$21.5 billion up to 2008 (Waldron et al., 2013). Post-2008 spending estimates have used different measures, making comparison difficult, but even so, a brief analysis suggests that spending has likely remained largely flat since 2008 (the 2015 total was 2% higher than the 2008 one, not accounting for inflation; CBD, 2020b). Funding for biodiversity in low- and middle-income countries (where the vast majority of globally important biodiversity is found) also requires strong support from international aid (Waldron et al., 2013; Miller et al., 2013) but average aid to biodiversity for 2013 to 2017 was \$6.3 billion per year, representing just 0.01% of the OECD's GDP of \$47,124 billion (OECD, 2020). Both domestic and international investment in conservation, therefore, needs to increase as part of the post-2020 framework.

Yet increasing funding for biodiversity alone is insufficient. Finance also needs to move away from biodiversity-harming industries such as fossil fuels (which are increasingly recognized to represent a capital risk) towards environmentally beneficial activities. The increasingly common requirement for loan recipients to comply

with Equator Principles on minimizing environmental and social impact as a condition of receiving capital investment is an example of such a transition already underway (Equator Principles Association, 2020).

3 | REFORMED ECONOMIC INCENTIVES

Increasing pro-biodiversity incentives and reducing biodiversity-harming incentives will also be needed to transform processes of production themselves. For example, government subsidies for sectors such as fossil fuel production and use, fisheries, and agriculture are estimated to be at least half a trillion dollars globally (OECD, 2019). Redirecting those subsidies so that they support economies and biodiversity simultaneously (rather than supporting economies to the detriment of biodiversity) is a major step towards reducing the drivers of biodiversity loss. Such proposals have been part of international agreements for decades, and they are also included in the post-2020 framework draft (Target 17; CBD, 2020a). However, they have met with resistance from vested interests and have received little follow-up in implementation (Dempsey et al., 2020). The zero draft must therefore clearly identify how vested interests will be addressed to make progress on subsidy reform. Governments will need to act and coordinate with relevant private sector actors to remove unsustainable incentives and promote the necessary transition, while carefully managing power inequalities, ensuring inclusiveness, and mitigating short-term equity impacts on vulnerable groups. Governments can also use their considerable leverage to increase taxes or fines on biodiversity-damaging enterprises (and reduce them on biodiversity-protecting ones). They may, for example, target current international tax havens, which have expanded in recent years and have contributed to illegal fishing and destructive cattle ranching (Galaz et al., 2018).

It is vital to align incentives within financial markets in such a way as to encourage the protection of (and investment in) biodiversity and to discourage its degradation. Initiatives such as green bonds, risk-related financial disclosures, and the alignment of executive remuneration with long-term environmental performance are rapidly becoming part of the architecture of financial reform (Jackson & Molho, 2018). Other tools to disincentivize biodiversity loss have included payments for ecosystem services schemes, including reduced emissions from deforestation and degradation schemes. To date, however, such payments have often proved too small to compete with alternative, biodiversity-harming forms of land use (Börner et al., 2017). Similarly, voluntary certification and labeling initiatives that attempt to create a price premium for

pro-biodiversity production by nudging demand (consumer behavior), have yielded mixed results (Morgans et al., 2018). A key reason for this limited success is that these initiatives are embedded in economic and institutional structures maintained by powerful special interest groups that prioritize economic growth over biodiversity concerns (Bartley, 2021). Thus, any change in incentives or nudges must be accompanied by efforts to address these political and economic interests, ensuring that the economic system reflects broader social values, including the value of protecting the future of the planet.

4 | EXPANDED REGULATION OF BUSINESS AND FINANCIAL SECTORS

The scope for private actors and businesses to transform their systems is determined by and embedded in larger structures. For example, many farmers are locked into large-scale resource-intensive monocultures by contractual obligation with agricultural suppliers and retailers or with investors and lenders, constraining their ability to adopt more sustainable practices (Oliveira & Hecht, 2016; Phelina & Choumert, 2017). Government action is indispensable to balance these large-scale forces and structures, reduce barriers for change, and catalyze sustainable and pro-biodiversity actions. Such measures should involve regulatory reform to ensure higher minimum standards for environmental, biodiversity, and social justice, and equity objectives. While some governments have taken on “no net loss” pledges for biodiversity, the regulatory apparatus for these promises has fallen short, whether in permit procedures, impact assessments, or market incentives (Maron et al., 2018). At the international level, trade and investment are major factors affecting biodiversity, and current global supply chain arrangements often encourage unsustainable sourcing or overproduction (Clapp & Isakson, 2018). Reforming these agreements and establishing green procurement policies, which include sustainability and biodiversity standards and certification schemes, can be powerful ways to promote pro-biodiversity production and trade (Lindström et al., 2020), although at present such measures remain weak (Dauvergne, 2018).

Regulation is also needed to reduce negative ecological impacts of the financial sector, including banks, pension funds, private equity, and insurance companies (Davis et al., 2020). The increased financialization of a wide array of operations related to agriculture, forestry, and mining, using speculative financial instruments such as commodity index funds, futures markets, and nature-based derivatives, has created financial incentives for unsustainable resource use and production and has also been implicated in price instability and market volatility, often

with negative environmental and social effects (Clapp & Isakson, 2018; Tadesse et al., 2014). This regulation of the financial sector also has economic co-benefits: Reducing systemic risks in the supply and trade of essential products (such as food and energy) enhances the resilience of social and economic systems. Regulation can also ensure that financial institutions, including banks and insurance companies, take biodiversity into account when they assess the value of their assets and the risks of planned investments. An important step in this direction was recently taken in EU financial regulation, which offers a classification system allowing businesses and investors to identify what economic activities can be considered sustainable, and thus discouraging greenwashing and encouraging the redirection of financial flows towards sustainability. Central banks can also play a key role in ensuring that biodiversity is taken into account in the decisions of financial intermediaries since they have at their disposal powerful levers such as the orientation of credit through monetary policy and the reshaping of more stringent financial regulations, including disclosures and reporting (EU High-Level Expert Group on Sustainable Finance, 2019).

5 | NEW METRICS FOR ECONOMIC AND BUSINESS PRACTICES

Transformative change will require more than the specific policy changes described above; deeper and structural changes in values and institutions are also needed. In turn, such structural changes can reinforce and accelerate further reforms in regulation and incentives, resulting in positive feedback loops. Changing metrics is a well-recognized strategy for effecting structural change in values and paradigms: By better measuring what we value, changes in values can be reflected in and catalyzed by changes in metrics (Stiglitz et al., 2009). We note that the post-2020 framework pays no attention to the need for reformed metrics or measures in any existing targets, thereby missing an important opportunity to catalyze transformative change (CBD, 2020a).

One prominent approach is physical or monetary natural capital accounting, which aims to include stocks and flows of environmental and biodiversity assets in accounting systems. Current efforts focus on the inclusion of biodiversity in corporate accounting as well as in national and EU-level accounts. These approaches can potentially provide much needed information about biodiversity impacts (Hein et al., 2020), and in so doing, they can contribute to enhanced sustainability and public accountability. However, for reasons related to the scope of the metrics as well as the disclosure of information, current initiatives fall short of delivering on these objectives, with a

potential risk that they will contribute to greenwashing and that they will stall rather than catalyze transformation (Helm, 2019). The EU has taken regulatory action on this front as part of its Green Deal, and it has taken the initiative to review its non-financial disclosure directive and to broaden its scope and quality by adding biodiversity metrics, and there are also other related initiatives, including the Taskforce on Nature-Related Financial Disclosure, and the Partnership for Biodiversity Financing Accounting. However, considerable research and implementation gaps remain. The lack of systematic information about biodiversity hampers the ability of governments, investors, and citizens to evaluate the biodiversity impacts of policy and private actions and monitor progress, and this negatively affects the accountability and legitimacy of governments and businesses (IPBES, 2019).

To address the limitations of growth as the objective of economic policy and of GDP as a measure (Stiglitz et al., 2009) countries can adopt new integrated metrics for social progress that include a broad perspective on ecological and social well-being. Several countries, including Bhutan, New Zealand, and Iceland have adopted or are developing such national metrics and indicators that encompass aspects related to biodiversity such as mental and physical health, living environment, and nature. A notable recent example is China's gross ecosystem product, which is meant to complement GDP to inform public policy decisions (Ouyang et al., 2020). The emerging movement around Doughnut Economics (Raworth, 2017) offers proposals to expand metrics to include unmonetized goods and services and natural and social assets and debts (instead of only transactions), and disaggregate metrics so that they demonstrate the (in)equities involved in the distribution of benefits and burdens of economic activities across different social groups.

A third action to reform metrics refers to the assessment of transformative change. Since transformative change will affect existing interests and livelihoods, we need metrics that can monitor progress and keep a check on the equitable distribution of benefits and burdens of transformation, including early warnings for unintended and unexpected outcomes. Such metrics must be informed by insights not only from economics and the natural sciences but also from other social sciences, law, and the humanities given the centrality of human perceptions of the economy and well-being.

6 | TRANSFORMING ECONOMIC SYSTEMS

Transformative change of our societies and economies is urgent not only for biodiversity but also to address cli-

mate change and achieve sustainable development goals. Governments play an indispensable role in fostering these required transformations. Governments historically have been promoters of economic development (Mazzucato, 2011)—a role that will no doubt increase in the immediate post-COVID-19 future— and they must take this role to collaborate with private actors to ensure that economic systems and activities are compatible with biodiversity. Markets in turn can provide the signals about what risks investors and consumers are unwilling to take, helping to guide government regulations to needed areas.

Effecting transformative change will require an approach that combines tangible policy measures with structural changes in values and institutions. The reforms in metrics, regulation, incentives, and investment highlighted here are interdependent and will need to be addressed in tandem. For example, financing for conservation will only make a difference if drivers of biodiversity loss are also reversed; reformed metrics can only be a game-changer if they are made actionable through incentive systems; and incentive systems can only be effective if they are embedded in an enabling regulatory environment. Taken together, actions on these fronts can catalyze profound changes in institutions and values that further catalyze the transformation of economic systems (Figure 1).

What such a transformed economic system looks like is the subject of much debate and conceptual ideas for circular, steady state, and green economies have been proposed (Jackson, 2017; Jackson & Victor, 2019; Raworth, 2017). Guided by values for just and fair economies, we need to consider what levels of consumption are sustainable and how a more equitable distribution of resources can be achieved (Gough, 2017). Since effective decoupling of economic growth from resource use has not yet been demonstrated, reductions in the scale and scope of the economy towards zero growth or degrowth, including physical limits on some forms of production and consumption, seem inevitable to many (O'Neill et al., 2018; IPBES, 2019; Parrique et al., 2019). Respecting ecological limits need not mean compromising human or planetary wellbeing, particularly if measures taken are just and equitable and if they effectively address excess wealth and consumption (Otto et al., 2019; Millward-Hopkins et al., 2020).

Given the inherently non-linear and unpredictable character of these transformations, a blueprint or recipe with clearly defined endpoints is neither possible nor desirable. Instead, an inclusive and integrated approach is needed that accounts for complexity and uncertainty while tracking progress, impacts, and trade-offs. The design, implementation, and monitoring of strategies and actions for transformative change will require substantial research effort and support by the scientific community, including funding organizations.

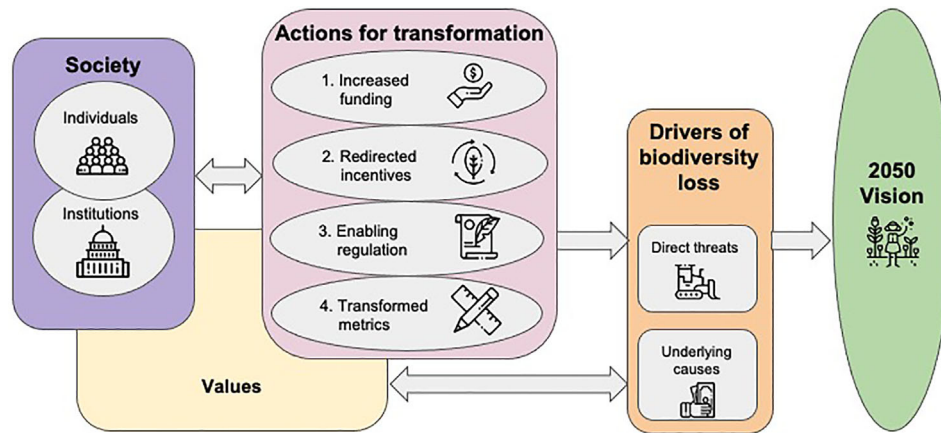


FIGURE 1 Action across four priority areas can affect values and institutions, address the drivers of biodiversity loss, and catalyze the transformative change needed to achieve the 2050 biodiversity vision.

7 | CONCLUSION

After COVID-19, revitalizing past unsustainable economic and ecological development trajectories is no longer an option. Reforming investments, incentives, regulations, and metrics provide a starting point for an integrated pathway to transform economic and financial systems. A coherent strategy is now needed that combines actions with short-term positive impacts such as redirecting subsidies, with those that will facilitate deeper structural transformation such as the introduction of new metrics. This multi-tiered approach is needed to scale up the changes resulting from these short-term actions and leverage them for wider transformation (McElwee et al., 2020). While the post-2020 framework suggests measures to reduce threats to biodiversity and encourage sustainable use and benefits from nature, it lacks a coherent strategy to deal with economic drivers of biodiversity loss and thus risks repeating the failures of the Aichi targets (CBD, 2020a). The actions and priority areas identified here suggest a way forward that avoids this outcome. In so doing, the post-2020 global biodiversity agenda can help support the urgent transformation of the economy that is needed to ensure human and ecological well-being.

ACKNOWLEDGMENTS

Pamela McElwee acknowledges the support of the Dean's biodiversity fund of the School of Environmental and Biological Sciences at Rutgers; Mireille Chiroleu-Assouline acknowledges the support of the Agence Nationale de la Recherche (ANR-17-EURE-0001); Eszter Kelemen has received support from the János Bolyai Research Grant of the Hungarian Academy of Sciences; Daniel Miller acknowledges the support from the John D. and Catherine T. MacArthur Foundation; Graciela M. Rusch acknowledges the support of the Norwegian Institute for Nature

Research (NINA) and the Norwegian Environmental Agency; Cindy Isenhour acknowledges the support from the National Science Foundation Convergence Program.

AUTHORS' CONTRIBUTIONS

Writing and revision (lead), figure development: Esther Turnhout. *Writing and revision (co-lead), figure development:* Pamela McElwee. *Writing and revision:* Mireille Chiroleu-Assouline. *Writing and revision:* Jennifer Clapp. *Writing and revision:* Cindy Isenhour. *Writing and revision:* Eszter Kelemen. *Writing and revision:* Tim Jackson. *Writing and revision:* Graciela M. Rusch. *Writing and revision:* Joachim H. Spangenberg. *Writing and revision, figure development:* Anthony Waldron. *Writing and revision, figure development:* Daniel C. Miller.

ETHICS STATEMENT

The authors conducted no data collection or scientific inquiry that required ethics considerations. The manuscript complies with proper ethical scientific standards.

DATA ACCESSIBILITY STATEMENT

This article draws on chapter 6, Section 4, including supplementary materials, of the Global Assessment of Biodiversity and Ecosystem Services by the Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services (IPBES). The chapter can be found here: https://www.ipbes.net/sites/default/files/ipbes_global_assessment_chapter_6_unedited_31may.

pdf. The supplementary materials of that chapter can be found here: https://ipbes.net/sites/default/files/2021-01/GA_chapter_6_supplementary_materials.pdf

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ORCID

Esther Turnhout  <https://orcid.org/0000-0002-2190-2076>

Pamela McElwee  <https://orcid.org/0000-0003-3525-9285>

Mireille Chiroleu-Assouline  <https://orcid.org/0000-0001-8810-4258>

Eszter Kelemen  <https://orcid.org/0000-0002-6409-1883>

Daniel C. Miller  <https://orcid.org/0000-0001-6812-0314>

REFERENCES

- Bartley, T. (2021). Power and the practice of transnational private regulation. *New Political Economy*, <https://doi.org/10.1080/13563467.2021.1881471>
- Börner, J., Baylis, K., Corbera, E., Ezzine-De-Blas, D., Honey-Rosés, J., Persson, U. M., & Wunder, S. (2017). The effectiveness of payments for environmental services. *World Development*, *96*, 359–374. <https://doi.org/10.1016/j.worlddev.2017.03.020>
- CBD (2020b). *Estimation of resources needed for implementing the Post-2020 Global Biodiversity Framework. Preliminary second report of the Panel of Experts on Resource Mobilization*. (CBD/SBI/3/5/Add.2 8 June 2020). Convention on Biological Diversity. <https://www.cbd.int/doc/c/d20d/1c03/c7b991efc0196788baa31539/sbi-03-inf-05-en.pdf>
- CBD (2020a). *Update of the zero draft of the post-2020 global biodiversity framework*. CBD. <https://www.cbd.int/doc/c/3064/749a/0f65ac7f9def86707f4eaefa/post2020-prep-02-01-en.pdf>
- Clapp, J., & Isakson, S. R. (2018). Risky returns: The implications of financialization in the food system. *Development and Change*, *49*(2), 437–460. <https://doi.org/10.1111/dech.12376>
- Coad, L., Watson, J. E., Geldmann, J., Burgess, N. D., Leverington, F., Hockings, M., Knights, K., & Di Marco, M. (2019). Widespread shortfalls in protected area resourcing undermine efforts to conserve biodiversity. *Frontiers in Ecology and Environment*, *17*(5), 259–264. <https://doi.org/10.1002/fee.2042>
- Dauvergne, P. (2018). The global politics of the business of 'sustainable' palm oil. *Global Environmental Politics*, *18*(2), 34–52. https://doi.org/10.1162/glep_a_00455
- Davis, K. F., Koo, H. I., Dell'angelo, J., D'odorico, P., Estes, L., Kehoe, L. J., Kharratzadeh, M., Kuemmerle, T., Machava, D., Pais, A. J. R., Ribeiro, N., Rulli, M. C., & Tattheo, M. (2020). Tropical forest loss enhanced by large-scale land acquisitions. *Nature Geoscience*, *13*, 482–488. <https://doi.org/10.1038/s41561-020-0592-3>
- Dempsey, J., Martin, T. G., & Sumaila, U. R. (2020). Subsidizing extinction? *Conservation Letters*, *13*(1), e12705. <https://doi.org/10.1111/conl.12705>
- Equator Principles Association (2020). *The equator principles. A financial industry benchmark for determining, assessing, and managing environmental and social risk in projects*. <https://equator-principles.com/wp-content/uploads/2020/05/The-Equator-Principles-July-2020-v2.pdf>
- EU High-Level Expert Group on Sustainable Finance. (2019). *Financing a Sustainable European Economy: Final Report of the High-Level Expert Group on Sustainable Finance*. European Union. https://www.buildup.eu/sites/default/files/content/180131-sustainable-finance-final-report_en.pdf
- Galaz, V., Crona, B., Dauriach, A., Jouffray, J. -B., Österblom, H., & Fichtner, J. (2018). Tax havens and global environmental degradation. *Nature Ecology & Evolution*, *2*, 1352–1357. <https://doi.org/10.1038/s41559-018-0497-3>
- Gough, I. (2017). Recomposing consumption: defining necessities for sustainable and equitable well-being. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, *375*, 20160379. <https://doi.org/10.1098/rsta.2016.0379>
- Hein, L., Bastid, K. J., Obst, C., Edens, B., Schenau, S., Castillo, G., Soulard, F., Brown, C., Driver, A., Bordt, M., Steurer, A., Harris, R., & Caparrós, A. (2020). Progress in natural capital accounting for ecosystems. *Science*, *367*(6477), 514–515. <https://doi.org/10.1126/science.aaz8901>
- Helm, D. (2019). Natural capital: assets, systems, and policies. *Oxford Review of Economic Policy*, *35*(1), 1–13. <https://doi.org/10.1093/oxrep/gry027>
- IPBES (2019). *Summary for policymakers of the global assessment on biodiversity and ecosystem services*. Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. <https://doi.org/10.5281/zenodo.3553579>
- Jackson, T. (2017). *Prosperity without growth, foundations for the economics of tomorrow*. Routledge.
- Jackson, T., & Molho, N. (2018). Which financial architecture can protect environmental commons? *Responsabilité et Environnement*, *92*, 69–73. <http://www.anales.org/re/2018/re92/2018-10-15.pdf>
- Jackson, T., & Victor, P. (2019). Unravelling the claims for and against green growth. *Science*, *366*(6468), 950–951. <https://doi.org/10.1126/science.aay074>
- Lindström, H., Lundberg, S., & Marklund, P. O. (2020). How green public procurement can drive conversion of farmland: An empirical analysis of an organic food policy. *Ecological Economics*, *172*, 106622. <https://doi.org/10.1016/j.ecolecon.2020.106622>
- Maron, M., Brownlie, S., Bull, J. W., Evans, M. C., Von Hase, A., Quétier, F., Watson, J. E. M., & Gordon, A. (2018). The many meanings of no net loss in environmental policy. *Nature Sustainability*, *1*, 19–27. <https://doi.org/10.1038/s41893-017-0007-7>
- Mazzucato, M. (2011). *The entrepreneurial state: Debunking public versus private sector myths*. Demos.
- McElwee, P., Turnout, E., Chiroleu-Assouline, M., Clapp, J., Isenhour, C., Jackson, T., Kelemen, E., Miller, D. C., Rusch, G., Spangenberg, J. H., Waldron, A., Baumgartner, R. J., Bleys, B., Howard, M. W., Mungatana, E., Ngo, H., Ring, I., & Santos, R. (2020). Ensuring a post-COVID economic agenda tackles global biodiversity loss. *One Earth*, *3*(4), 448–461. <https://doi.org/10.1016/j.oneear.2020.09.011>
- Miller, D. C., Agrawal, A., & Roberts, J. T. (2013). Biodiversity, governance, and the allocation of international aid for conservation. *Conservation Letters*, *6*(1), 12–20. <https://doi.org/10.1111/j.1755-263X.2012.00270.x>
- Millward-Hopkins, J., Steinberger, J. K., Rao, N. D., & Oswald, Y. (2020). Providing decent living with minimum energy: A global scenario. *Global Environmental Change*, *65*, 102168. <https://doi.org/10.1016/j.gloenvcha.2020.102168>

- Morgans, C. L., Meijaard, E., Santika, T., Law, E., Budiharta, S., Ancrenaz, M., & Wilson, K. A. (2018). Evaluating the effectiveness of palm oil certification in delivering multiple sustainability objectives. *Environmental Research Letters*, *13*(6), 064032–064012. <https://doi.org/10.1088/1748-9326/aac6f4>
- O'Neill, D. W., Fanning, A. L., Lamb, W. F., & Steinberger, J. K. (2018). A good life for all within planetary boundaries. *Nature Sustainability*, *1*, 88–95. <https://doi.org/10.1038/s41893-018-0021-4>
- OECD. (2019). *Biodiversity: Finance and the economic and business case for action*. Report prepared for the G7 Environment Ministers' Meeting. <https://www.oecd.org/environment/resources/biodiversity/G7-report-Biodiversity-Finance-and-the-Economic-and-Business-Case-for-Action.pdf>
- OECD. (2020). *OECD creditor reporting system*. <https://stats.oecd.org/Index.aspx?DataSetCode=crsl>
- Oliveira, G., & Hecht, S. (2016). Sacred groves, sacrifice zones and soy production: globalization, intensification and neo-nature in South America. *The Journal of Peasant Studies*, *43*(2), 251–285. <https://doi.org/10.1080/03066150.2016.1146705>
- Otero, I., Farrell, K. N., Pueyo, S., Kallis, G., Kehoe, L., Haberl, H., Plutzer, C., Hobson, P., García-Márquez, J., Rodríguez-Labajos, B., Martín, J.-L., Erb, K. -H., Schindler, S., Nielsen, J., Skarin, T., Settele, J., Essl, F., Gómez-Baggethun, E., Brotons, L., ... Pe'er, G. (2020). Biodiversity policy beyond economic growth. *Conservation Letters*, *13*(34), e12713. <https://doi.org/10.1111/conl.12713>
- Otto, I. M., Kim, K. M., Dubrovsky, N., & Lucht, W. (2019). Shift the focus from the super-poor to the super-rich. *Nature Climate Change*, *9*, 82–84. <https://doi.org/10.1038/s41558-019-0402-3>
- Ouyang, Z., Song, C., Zheng, H., Polasky, S., Xiao, Y., Bateman, I. J., Liu, J., Ruckelshaus, M., Shi, F., Xiao, Y., Xu, W., Zou, Z., & Daily, G. C. (2020). Using gross ecosystem product (GEP) to value nature in decision making. *Proceedings of the National Academy of Sciences*, *117*(25), 14593–14601. <https://doi.org/10.1073/pnas.1911439117>
- Parrique, T., Barth, J., Briens, F., Kerschner, C., Kraus-Polk, A., Kuokkanen, A., & Spangenberg, J. H. (2019). *Decoupling debunked: Evidence and arguments against green growth as a sole strategy for sustainability*. European Environmental Bureau. <https://mk0eeborgicuyctuf7e.kinstacdn.com/wp-content/uploads/2019/07/Decoupling-Debunked.pdf>
- Phélinas, P., & Choumert, J. (2017). Is GM soybean cultivation in Argentina sustainable? *World Development*, *99*, 452–462. <https://doi.org/10.1016/j.worlddev.2017.05.033>
- Raworth, K. (2017). *Doughnut economics*. Penguin.
- Stiglitz, J., Sen, A. K., & Fitoussi, J. P. (2009). *The measurement of economic performance and social progress revisited. Report of the Commission on the measurement of economic performance and social progress*. https://www.economie.gouv.fr/files/finances/presse/dossiers_de_presse/090914mesure_perf_eco_progres_social/synthese_ang.pdf
- Tadesse, G., Algieri, B., Kalkuhl, M., & Von Braun, J. (2014). Drivers and triggers of international food price spikes and volatility. *Food Policy*, *47*, 117–128. <https://doi.org/10.1016/j.foodpol.2013.08.014>
- Waldron, A., Mooers, A. O., Miller, D. C., Nibbelink, N., Redding, D., Kuhn, T. S., Roberts, J. T., & Gittleman, J. L. (2013). Targeting global conservation funding to limit immediate biodiversity declines. *Proceedings of the National Academy of Sciences*, *110*(29), 12144–12148. <https://doi.org/10.1073/pnas.1221370110>
- Waldron, A., Adams, V., Allan, J. Arnell, A., Asner, G., Atkinson, S., Baccini, A., Baillie, J. E. M., Balmford, A., Beau, J. A., Brander, L., Brondizio, E., Bruner, A., Burgess, N., Burkart, K., Butchart, S., Button, R., Carrasco, R., Cheung, W., ... Zhang, Y. (2020). *Protecting 30% of the planet for nature: costs, benefits and economic implications. Working paper analysing the economic implications of the proposed 30% target for areal protection in the draft post-2020 Global Biodiversity Framework*. https://www.conservation.cam.ac.uk/files/waldron_report_30_by_30_publish.pdf
- WEF. (2020). *Global risks report*. World Economic Forum. http://www3.weforum.org/docs/WEF_Global_Risk_Report_2020.pdf

How to cite this article: Turnhout Esther, McElwee Pamela, Chiroleu-Assouline Mireille, Clapp Jennifer, Isenhour Cindy, Kelemen Eszter, Jackson Tim, Miller Daniel C., Rusch Graciela M., Spangenberg Joachim H., Waldron Anthony. Enabling transformative economic change in the post-2020 biodiversity agenda. *Conservation Letters*. 2021;e12805. <https://doi.org/10.1111/conl.12805>