

The Future of Nature and Business Policy Companion

Recommendations for
policy-makers to reset
towards a new nature
economy

In collaboration with SYSTEMIQ

Contents

	Executive summary	4
1	Introduction	5
2	Building blocks for a resilient economic recovery	6
	2.1 Protect and restore natural capital assets	7
	2.2 Enhance resource productivity	9
	2.3 Scale regenerative value chains	11
3	Policy enablers to unlock value	13
4	Conclusion	17
	Acknowledgements	18
	Endnotes	20

World Economic Forum
91-93 route de la Capite
CH-1223 Cologny/Geneva
Switzerland
Tel.: +41 (0)22 869 1212
Fax: +41 (0)22 786 2744
Email: contact@weforum.org
www.weforum.org

© 2020 World Economic Forum. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, including photocopying and recording, or by any information storage and retrieval system.

Executive summary

In total, \$11.5 trillion has already been earmarked for COVID-19 stimulus packages globally¹ and trillions more will have to be spent over the course of a long recovery.² We now have an opportunity to ensure nature is integrated into economies as part of a great reset in a way that delivers good jobs, new sources of economic value and the natural capital needed for public health and societal resilience. We will not have this opportunity again – at least not in this critical decade.

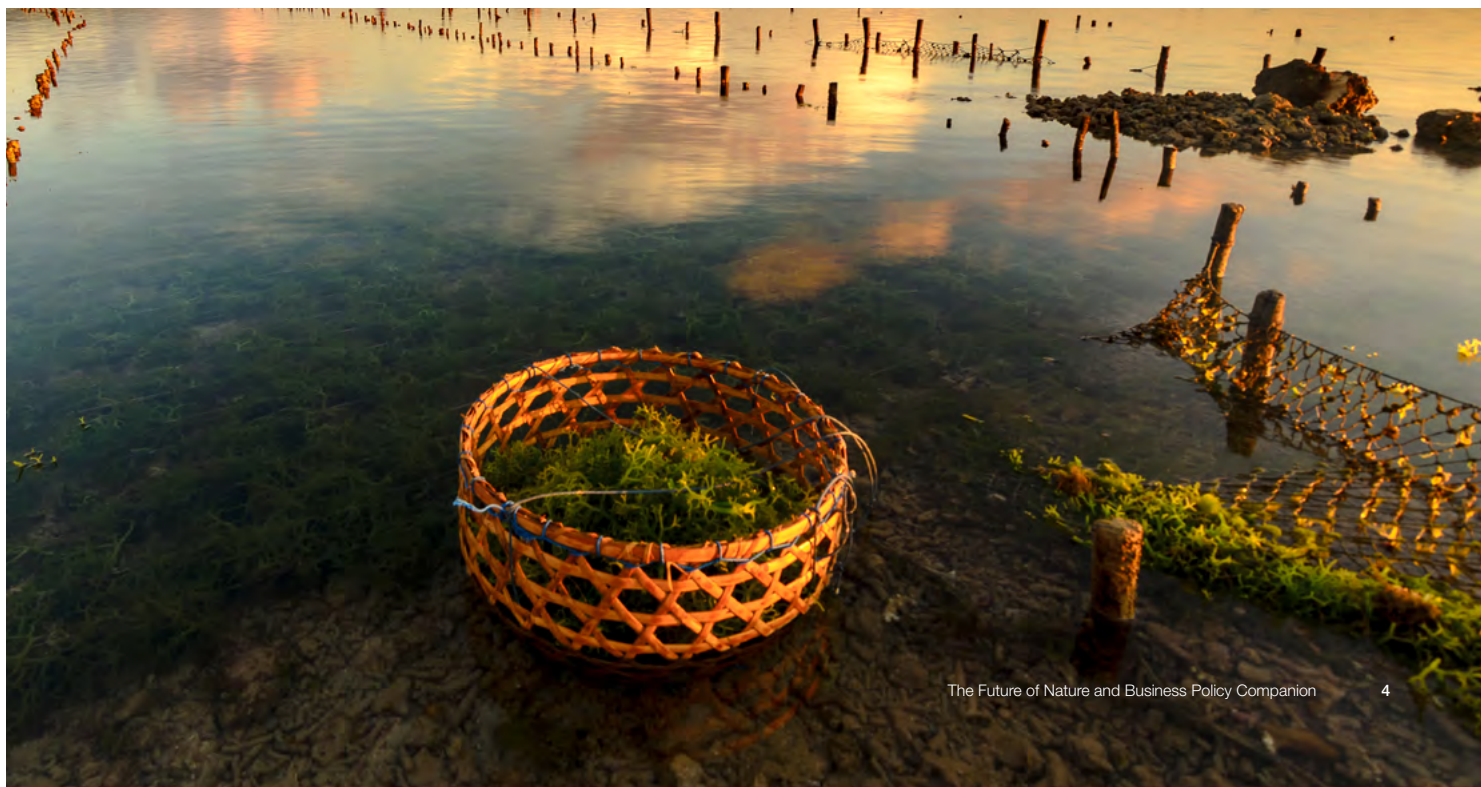
This report builds on the World Economic Forum's report *The Future of Nature and Business* to supplement and contextualize the findings in light of the COVID-19 crisis, with a focus on policy measures. The central proposition of this report is that the right investments in nature create a stronger economic future and reduce the risk of permanent economic scarring. A stimulus programme focused on: (1) protecting and restoring nature; (2) driving resource productivity; and (3) scaling up new, regenerative value chains could set the policy and regulatory frameworks to:

- Lay the foundations for creating up to 395 million jobs over the next decade, arising from the systemic transitions laid out in *The Future of Nature and Business*
- Restore the stock of natural capital that is the foundation for a resilient and sustainable economy

- Benefit human health through improved nutritional security, reduced air and water pollution and reduced risk associated with zoonotic disease spillover³ and extreme weather events from climate change

Directing stimulus spending towards nature-positive opportunities is a good first step, but it needs to be combined with other measures to drive a permanent change in our economic pathways. Stimulus packages should be combined with strong safeguards for living in harmony with nature and ensuring equity of access and outcomes among people. Policy-makers need to take strong actions to reset the socioeconomic system for the longer term: measuring the right things; managing marine and terrestrial assets with spatial planning; fixing incentives to ensure markets value nature appropriately; enabling the innovation ecosystem; investing in human capital for better-paid, more secure jobs; and deploying public finance catalytically.

There is no pathway towards a more resilient economic system that does not protect, invest in and rebuild natural capital. If the human and economic costs of COVID-19 teach us anything, it is that nature is the foundation of economies designed for greater resilience, equity and well-being.



1 Introduction

Over the next decade, the world faces the enormous challenge of resetting the economy in a way that delivers decent jobs, more resilient societies and greater equity, while addressing the looming crises of climate change and nature loss, and establishing an operational model that lies within planetary boundaries.

Historically, investment in nature has been treated as a “nice to have” – something societies can afford in good times. The norm has been for economies to first run down their natural capital, converting it into social and physical capital, before eventually starting to rebuild it domestically (while continuing to offshore nature-depleting activities). There is a growing set of compelling environmental and societal proof points as to why this cannot continue, from climate change and biodiversity loss to growing social and interregional inequities.^{4,5}

There is now a chance to combine the environmental and social case for stewarding natural capital with a strong economic argument. The World Economic Forum’s second report in its New Nature Economy series, *The Future of Nature and Business*, lays out the case for business: \$10 trillion of opportunity by 2030, and the potential to create 395 million jobs in developed and developing countries.⁶ In this future, nature and the economy are no longer separate, but in a relationship of deepening interdependence and greater mutual returns.

This companion paper lays out options for policy-makers to seize the opportunity to build a nature-positive economy in light of the COVID-19 health and economic crisis. As much as \$11.5 trillion has already been earmarked for COVID-19 rescue and recovery packages around the world.⁷ **The right stimulus programme can be a catalyst for the great reset that is being called for, where natural**

capital is protected, restored and sustainably managed as a necessary input to the wider economic agenda.⁸

Conversely, deploying stimulus packages to maintain the status quo will result in significant and growing economic costs as a direct result of natural capital depletion and accelerated climate change. Business-as-usual policies would make catastrophes previously considered to be tail risks, such as concurrent crop failures in several of the world’s main food-producing regions or future pandemics, increasingly likely.

Section 2 shortlists opportunities that governments can start supporting today, chosen among those presented in *The Future of Nature and Business* for their potential to deliver short-term jobs and economic benefits. They are organized into three main building blocks: (1) protecting and restoring natural capital assets; (2) driving resource productivity; and (3) scaling up new, regenerative value chains.

The gains will not be sustained unless they are backed by deeper policy changes. Section 3 therefore describes the essential policies needed to drive a permanent transformation in our economic trajectory, to deliver vital social and economic benefits, while helping to rebuild our natural world. Businesses around the world are already calling for such policies to reverse nature loss in this decade and to ensure healthy societies, resilient economies and thriving businesses.⁹ This paper makes the case that, going forward, nature is not a form of capital that can be depleted. Rather, it is a foundational economic asset, less replaceable and certainly more fragile than other forms of capital, such as produced and financial capital.



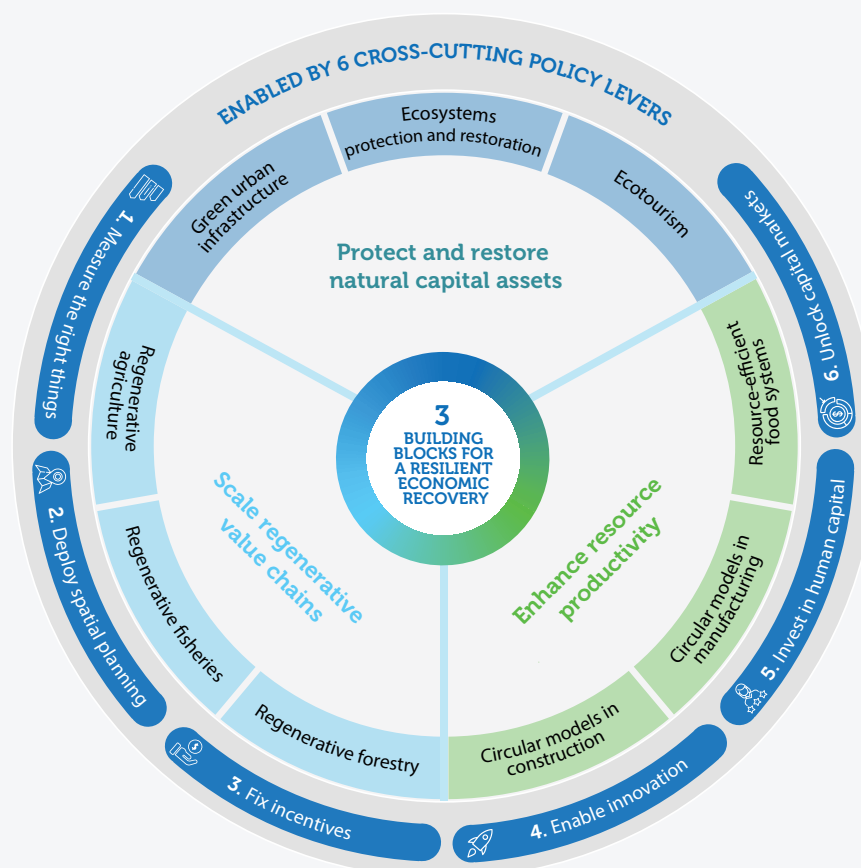
2 Building blocks for a resilient economic recovery

In times of crisis, the temptation is to tread on familiar ground. In the wake of the 2007–2008 financial crisis, many governments poured money into fossil fuel-intensive sectors in an attempt to stimulate the economy.¹⁰ This report is clear that investing public capital to restore business as usual is not an opportunity, but a liability. This section presents three sources of economic value that governments can start unlocking today by investing in nature-positive opportunities as part of stimulus

spending (Figure 1). These opportunities are a subset of the 60+ opportunities explored in *The Future of Nature and Business*. They were selected for their potential to set the foundations for future business and jobs, their risk-reduction impact in the COVID-19 context, and because they are areas in which governments can play a catalytic role. For each, we explain what governments can do today, in terms of directing financial stimulus and implementing policy measures.

FIGURE 1

Unlocking the opportunities of a nature-positive recovery by investing in three building blocks for economic recovery and implementing six cross-cutting policy levers



2.1 Protect and restore natural capital assets

Despite our dependence on healthy land, and on coastal and marine ecosystems, we are depleting them at an alarming rate, which undermines the resilience of our economies and exposes humanity to natural liabilities, including the increased risk of zoonotic disease spillover,^{11,12} or simultaneous breadbasket failure.¹³ Protection and restoration of natural assets is therefore an essential foundation for a resilient economic system, in both urban and rural areas.

Nature-positive policy opportunities:

Invest in **Green urban infrastructure**: use public and private investments to transform cities into engines of innovation, resilience and prosperity by integrating nature into their design.

Cities today face huge challenges: ambient air pollution claims more than 4 million lives annually,¹⁴ and there is overcrowding, congestion and enormous resource pressure with reliance on extracting “surplus” natural capital from the countryside. By 2050, 68% of the world’s population is expected to live in cities,¹⁵ but 60% of urban areas are yet to be built, which presents a huge opportunity for directing investments into nature-positive infrastructure, such as:

- **Expanding public green spaces through large-scale planting, conversion of brown sites into ecological conservation areas and the creation of green corridors** alongside existing infrastructure. Increased green space has a host of benefits, from creating jobs, to reducing urban temperatures and crime,¹⁶ to improving citizen health^{17,18} and well-being,¹⁹ to driving productivity and innovation.²⁰ There are many micro-examples of cities investing in nature to enhance resilience, improve liveability and create jobs that could be replicated many times over.²¹ For example, in Medellín, Colombia, the local government has planted 30 green corridors around the city, helping to reduce average city temperatures by 2°C. Similarly, the local government in Durban, South Africa, developed a landfill site into an ecological conservation area and employment programme. Each of these opportunities will create localized jobs, strengthening the interest of local constituencies in supporting ecological outcomes. To seize this opportunity, governments need to invest in smart urban planning and central government should work with municipalities to help them put the right financing structures and public-private models in

place, with local value-capture mechanisms (from rates to property development equity models) used to share the economics equitably.

- **Using nature-positive infrastructure design to enhance the resilience of urban environments.** Constructed ecosystems, including green roofs, bioretention systems and constructed wetlands are artificial, custom-built components of green infrastructure that are becoming more common in cities.²² The government of the city of Salford, UK, invested more than \$12 billion in a constructed flood storage wetland (of more than 5 hectares) to protect almost 2,000 homes from flood risk, boost access to green space and increase biodiversity.²³

On a smaller scale, green roofs can reduce energy costs, capture storm water to reduce flood risk, create habitats for urban wildlife, reduce air pollution and urban heat, and even produce food. The market for green roofs is currently worth \$9 billion and is set to grow by 12% annually through to 2030.²⁴ Costs are falling, due to a combination of innovation and government support; in Singapore, for example, costs fell from around \$105 to \$70 per square metre between 2016 and 2018,²⁵ and the city’s 72 hectares of rooftop gardens and green walls are expected to triple by 2030.²⁶

Other opportunities include installing permeable pavements and cycle lanes that allow rainwater to pass into the underlying soil to reduce flood risk, support urban tree health (reducing air pollution) and provide natural water treatment.²⁷

Local governments can send a clear market signal for such green urban infrastructure by including requirements in planning permission for new buildings, and by rolling out installations across publicly owned assets.

Mobilize for large-scale Ecosystems Protection and Restoration, to mitigate growing risks from nature loss and climate breakdown, create jobs and boost rural livelihoods.

There is no pathway to achieving the goals of the Paris Agreement, nor to the Sustainable Development Goals (SDGs), without immediate protection and restoration of important ecosystems, particularly forests and wetlands (mangroves, peatlands and marshes).²⁸

- **Natural forests** store 40 times more carbon than plantation equivalents and are hotspots of biodiversity,²⁹ yet the rate of tropical forest loss (one football pitch every six seconds in 2019) has remained high for the past two decades.³⁰ **Mangrove** forests provide more than \$80 billion per year in avoided losses from coastal flooding and directly protect 18 million people in coastal areas. They also contribute \$40–50 billion annually through fisheries, forestry and recreation benefits. Every \$1 invested in mangrove conservation and restoration generates a benefit of \$3, with conservation of existing mangroves yielding significantly higher benefits (88:1) than restoring degraded ones (2:1).³¹ **Peatlands** cover just 3% of the world's land but store up to 25% of all soil carbon.³² Currently between 1 and 2 billion tonnes of carbon dioxide are lost from peat soils a year, despite limited benefits from the economic activities that disturb them.³³

Restoring degraded forests generates between \$7 and \$30 in economic benefits for every \$1 invested.³⁴ It is also a relatively low-skilled and labour-intensive exercise – an attractive proposition today with global employment forecast to decrease by up to 240 million jobs as a result of COVID-19, with Asia potentially worst hit.³⁵ Similarly, there is a 10:1 return from mangrove conservation and restoration.³⁶ Overall, new research suggests that expanding protected and conserved areas to at least 30% of our planet will result in financial and economic benefits exceeding the costs by a factor of at least 5:1 – 30% protection of our planet leads to increased economic output averaging \$250 billion annually and generates additional non-monetized economic benefits from ecosystem services averaging \$350 billion annually by 2050.³⁷

Some countries are already seizing these opportunities as part of their stimulus measures: Germany allocated \$700 million for forest conservation and management;³⁸ New Zealand aims to create 11,000 jobs in restoring wetlands and riverbanks, removing invasive species and improving tourism and recreation services on public lands;³⁹ and the World Bank is providing \$188 million and technical assistance to promote ecosystem restoration and disaster resilience in Pakistan, with the potential to mobilize 65,000 youths and labourers to establish 12 new national parks.⁴⁰

For conservation and restoration schemes to reach speed and scale – moving from individual, often subsidized, projects to systemic change that can mobilize private-sector ingenuity – both

sticks (taxing pollution, closing off free access to natural resources and eliminating perverse incentives for land conversion, regulation and enforcement) and carrots (spatial planning, payments for ecosystem services designed to optimize environmental benefits, reforming agricultural subsidies, access to relevant public goods such as satellite monitoring data) are needed. These cross-cutting public policies that will be crucial to unlocking the full benefits are discussed in more detail in Section 3.

Protect and scale **Ecotourism** infrastructure to preserve the sector's jobs and economic value and pave the way for further growth.

Prior to the COVID-19 pandemic, ecotourism was one of the fastest-growing subsectors⁴¹ of the travel and tourism industry, which was growing at a rate 40% faster than the overall global economy in 2019.⁴² Most ecotourism occurs in or around protected areas,⁴³ which are estimated to receive 8 billion visits a year, generating revenue and supporting local livelihoods.⁴⁴

The economic prize from supporting and scaling the nature-based tourism economy is evidenced by the case of Costa Rica, where the sector was growing by more than 6% per year pre-COVID-19, contributing more than 13% of GDP and generating around 28% of direct and indirect employment.^{45,46} This has been supported by a raft of progressive policies – including the elimination of cattle subsidies (reducing pressure on forests) and the introduction of payments for ecosystem services.⁴⁷

But this source of economic value is now at risk. The global tourism industry is forecast to contract by up to 25% in 2020,⁴⁸ with annual costs to the (largely wildlife-based) African tourism sector projected at \$50 billion and 2 million job losses.⁴⁹ Urgent action is required to support this sector in the short term. Governments should provide emergency funding and grants to private-sector enterprises, community-based organizations and conservation NGOs to maintain the integrity and functioning of the assets (aesthetic landscapes, iconic megafauna and biodiversity-rich ecosystems) upon which the industry relies. But for the sector to flourish in the longer term, it will require diversification of income streams for natural assets, most importantly through payments for ecosystem services as well as enforced protected areas. In the absence of a concerted effort to rescue this sector, an increase in land-grabbing, deforestation, illegal mining and wildlife poaching can be expected, further fuelling the vicious cycle of nature loss and economic risks.

2.2 Enhance resource productivity

Our economic system is riddled with inefficiencies. One-third of food that is produced is wasted, resulting in greater food insecurity, unnecessary greenhouse gas emissions and direct economic losses of \$1.25 trillion a year.⁵⁰ Meanwhile, large areas of land are locked up in low-productivity activities such as extensive cattle-rearing.⁵¹ Inefficiently used natural resources also permeate our built environment: The construction sector consumes more than 50% of Europe's natural resources, with 54% of materials from demolition landfilled.⁵²

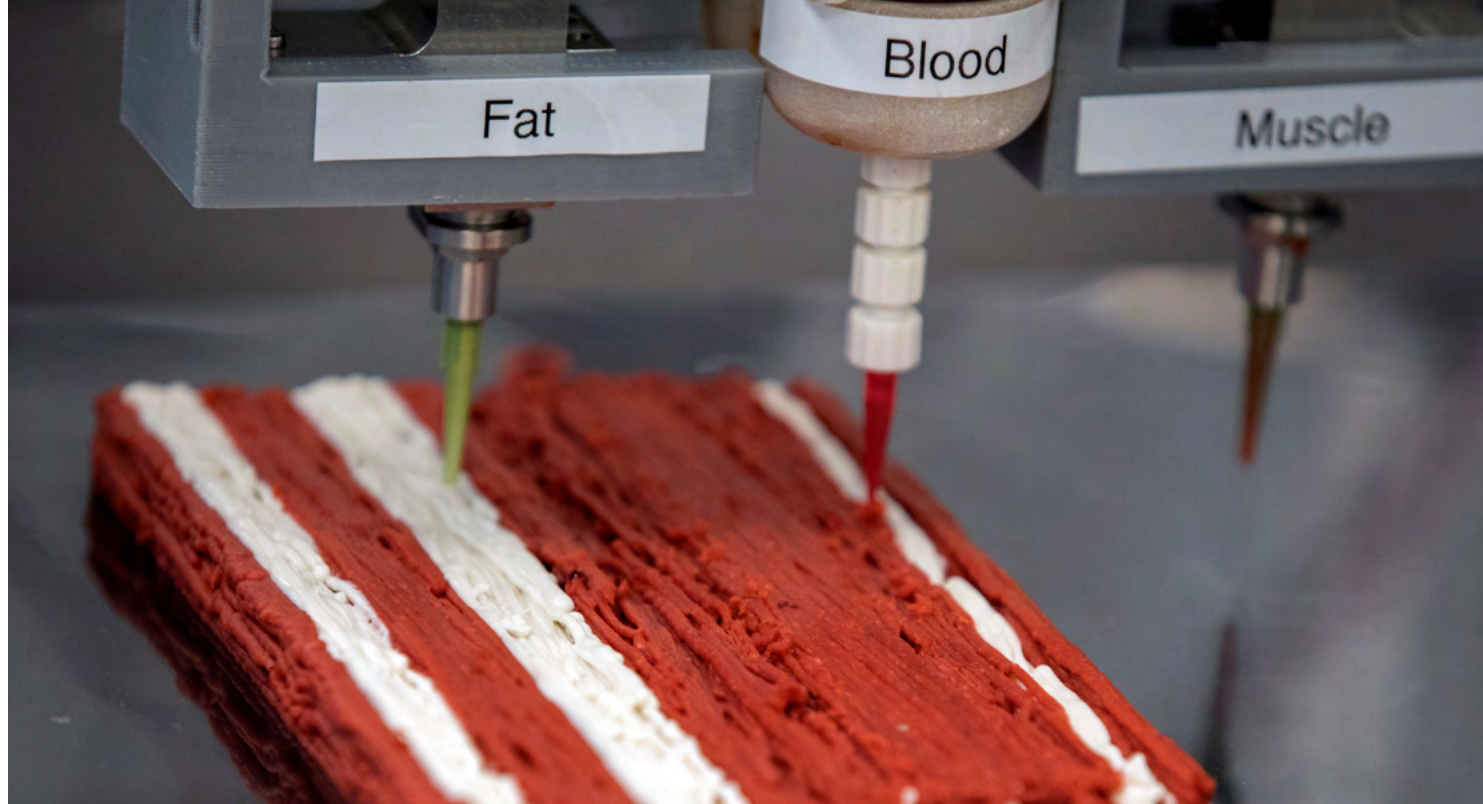
Enhancing the productivity of the resources we have is essential for building economic resilience. This reduces import reliance for critical raw materials and exposure to supply chain risks, volatile raw material prices and natural capital depletion.⁵³

Nature-positive policy opportunities:

Develop the infrastructure and incentives to support **Circular business models** and decouple economic growth from natural resource depletion.⁵⁴ This entails investments in infrastructure such as waste collection services, sorting, repair, recycling and remanufacturing facilities, as well as incentives and regulations to switch to renewable and recyclable materials, particularly in the construction and manufacturing sectors.

- In the **construction sector**, non-metallic minerals such as sand, gravel and clay account for about 50% (44 billion tonnes) of all resources that we extract from the Earth. With 2.3 billion new urban dwellers expected by 2050, producing the corresponding new housing required could claim up to 20% of the remaining carbon budget for 2020–2050 if mineral-based construction materials are used. By contrast, a shift to circular bioeconomy solutions based on engineering wood or bamboo could substantially reduce both the amount of materials used and the carbon footprint of our cities while creating durable carbon pools.⁵⁵ Using wood in construction has a climate mitigation effect of 2.4–2.9kg CO₂ per kg of product used when compared to concrete. Building with wood is also more resource-efficient as it can reduce the total amount of materials used in construction by 50%.⁵⁶
- In **manufacturing**, a growing number of companies are committing to a *Circular Bio-Economy*⁵⁷ by developing renewable and recyclable bio-based products that can substitute for plastic, glass and other non-renewable materials.⁵⁸ Packaging made using recyclable paperboard from sustainably managed forests helps to reduce emissions, with a renewable alternative to fossil-based materials, but it





REUTERS/AMIR COHEN

also enables recycling and reduced waste. Furthermore, there is strong consumer demand, with 89% of eco-conscious consumers paying close attention to packaging material when making purchasing decisions.⁵⁹

As governments design support packages targeted at the construction and manufacturing industries, they should consider opportunities not only to decarbonize but also to improve the circular economy performance of those sectors. This will enable businesses to realize the value from circular business models – estimated by the World Economic Forum at more than \$2 trillion by 2030 across key sectors, while creating jobs and reducing pressure on nature from resource extraction.⁶⁰ The EU Circular Economy Package is an example of how regulation can drive a shift towards a circular bio-economy – in this case, for packaging.

Encourage the shift to **Resource-efficient food systems**. This entails setting national strategies to reduce food loss and waste, targeted investments in food logistics infrastructure and social capital, as well as setting regulatory standards for diversification to less resource-intensive protein diets.

The food system has been successful at producing cheap food for many billions globally; but it is currently extremely wasteful, both in terms of the waste and loss that happens in food value chains, and in the choice of resource-intensive foods. Improved food logistics infrastructure, such as solar-powered cold storage, tackles food loss and waste and reduces agricultural land requirements. It also creates jobs (estimated by the World

Economic Forum at 6 million jobs globally by 2030),⁶¹ enhances food security and provides export opportunities.

By prioritizing investment in food logistics infrastructure (such as warehouses and processing equipment) and in associated skills training and reskilling, governments can complement and support the mobilization of private capital into more efficient end-to-end value chains. India, for example, recently announced a \$13 billion fund as part of its stimulus package to finance cold chains storage, and post-harvest management infrastructure, recognizing the dual opportunity to reduce waste and boost employment.⁶² Côte d'Ivoire included a target to improve packaging, harvesting and conservation infrastructure in its Nationally Determined Contribution (NDC) submitted under the Paris Climate Agreement.⁶³

Another set of policy measures that would stimulate more resource-efficient food systems entail directing stimulus packages towards R&D to support the diversification away from diets based on resource-intensive animal proteins, and towards four main categories of alternatives – aquatic, plant-based, insect-based and laboratory-cultured. Private capital is pouring into this emerging sector,⁶⁴ whose market growth offers the potential for 30 million new jobs by 2030.⁶⁵ Regulatory standards will also need to be set to ensure products reaching the market are safe and healthy, along with a Just Transition from the traditional meat sector (along with reskilling). Corporate bailout packages for the meat sector could accelerate these developments by establishing even higher standards for health and safety, both of the products and employment conditions.

2.3 Scale regenerative value chains

Fifteen years ago, governments and investors viewed renewable energy as a sector with limited economic potential. That picture has changed dramatically: In 2018, the sector attracted more than \$270 billion of investment⁶⁶ and supported 11 million jobs.⁶⁷ We are now on the cusp of a similar revolution with regenerative value chains. And there is a huge potential prize: Regenerative agriculture alone could deliver \$1.2 trillion in economic benefits by 2030.⁶⁸ But as in the renewable energy industry 15 years ago, regenerative businesses are still emerging. With the right level of government support, this asset class could massively scale, create millions of jobs and reduce risks to food, forestry, fisheries and other nature-based economic sectors by rebuilding the natural capital on which they depend.

Nature-positive policy opportunities:

[Accelerate the transition to Regenerative agriculture with innovative financial models and incentives.](#) Regenerative farming practices blend advanced technologies, such as in-field sensors and satellite monitoring, with traditional techniques, such as crop rotation and agroforestry. The objective is to maximize productivity levels while reducing inputs, restoring soil health for future yields, increasing agrobiodiversity⁶⁹ (thus resilience to pests or weather extremes) and reducing freshwater and ocean run-off. Healthy soils also play a role in climate change mitigation through carbon sequestration.⁷⁰ Global estimates suggest that investment in regenerative agriculture could generate an additional 200 million full-time jobs in 2050.⁷¹

Some governments are already taking steps to maximize this opportunity. The Australian state of Queensland established a \$325 million Land Restoration Fund offering additional revenue for farmers adopting regenerative practices that reduce water consumption and run-off, leading to greater land value, productivity and employment.⁷² Similarly, the Andhra Pradesh state government in India established a financing and farmer-to-farmer training programme to help 6 million farms transition to profitable, regenerative farming practices by 2024, with financing of \$2 billion.⁷³

Governments should seize the opportunity to establish innovative financial models that encourage farmers to shift to more regenerative practices. These investments often require strong public-private

collaboration and an emphasis on rapid field testing and open data sharing. The procurement power of municipal bodies and government offtake guarantees can increase demand for local, regeneratively produced food. Finally, governments should ensure that subsidies paid to farmers support public goods (just 15% of today's agricultural subsidies deliver public goods).⁷⁴ Positive examples of countries seeking to reform subsidies to this end include the United Kingdom⁷⁵ and China.⁷⁶

[Accelerate the transition to Regenerative fisheries with public finance and incentives.](#)

Fish currently provide 3 billion people with 20% of their animal protein.⁷⁷ With the global population expected to reach more than 9 billion by 2050, recent studies show that the marine environment can produce six times more food to bolster nutritional security,⁷⁸ with nearly all additional outputs coming from mariculture.^{79,80} Developments in sustainable feed (sourced from algae and insects), as well as new technologies (sensing, tracking and ledging), mean that this sector is ready to scale with much lower negative impact. China's support for the seaweed industry⁸¹ and Norway's Ocean Farm 1 (scaled, offshore-fed mariculture)⁸² are successful examples of publicly scaled mariculture.⁸³

However, the full potential of this opportunity can be realized only if essential habitats – estuaries, wetlands, mangrove forests and coral reefs – are protected and if nutrient and plastic pollution are reined in. Marine Protected Areas (MPAs) are proven to address some of these concerns, yet less than 3% of the ocean is currently designated as non-extractive marine reserves.⁸⁴ Furthermore, a new study shows that strategic designation of MPAs could increase food provision by almost 11 million tonnes, relative to a conservative business-as-usual scenario of fisheries' prospects.⁸⁵

Governments can play a vital role in growing regenerative marine aquaculture businesses through catalytic public finance and strategic incentives that integrate ocean protection. Blended finance models – which use public or philanthropic capital to mitigate investment risks – can mobilize commercial capital for sustainable aquaculture. Accompanying marine spatial planning would help identify usage rights, along with the enabling environment to support private-sector investment (e.g. incentives such as feed efficiency standards, or guaranteed demand through government procurement).

Scale **Regenerative forest business models.**

Forest-based industries employ tens of millions of people and contribute an estimated \$450 billion⁸⁶ to annual national incomes globally – including more than \$250 billion per year to economies in developing countries. Investing in more regenerative business models for forests has huge potential, especially in the 600 million hectares of the tropical belt that are vulnerable to depletion.⁸⁷ Regenerative models create value from standing forests, regrowing forests or agricultural “production-protection” approaches.⁸⁸ Supporting these models builds livelihoods, underlining the value of standing or sustainably managed forests. Targeting financial support at exposed areas of tropical forests could – in combination with proper regulation and enforcement – effectively “seal off” the forest frontier, protecting the vast natural capital that lies behind it.

The harnessing of regenerative forest value chains can be accelerated through the introduction of payment for ecosystem services to forest owners and managers as demonstrated by California’s carbon market.⁸⁹ Success, particularly in many developing countries, will also require public finance to support the development of new opportunities and to build the capacity of local communities to engage with such schemes. But this capital will be effective in generating viable business models only if it is matched by improvements in land-use planning and resulting zoning and regulations, by strong tenure rights – especially for Indigenous peoples and other forest-dependent populations – and by effective enforcement. The latter has never been more important in light of COVID-19, where there is a risk of deliberately relaxed environmental regulations or gaps in enforcement.⁹⁰ Building a thriving, regenerative forest asset class for the future depends on strong protective action today.



3 Policy enablers to unlock value

Investment in nature-positive opportunities supports economic growth, job creation and social and environmental resilience. But these benefits will be short-lived unless governments step up to tackle the policy distortions and institutional weaknesses that affect resource allocation in today's economic system. These are not easy steps to take and will require political courage to rise above the short-term calculus of growth at all costs. To deliver the full value of a nature-positive economy, decision-makers need to put in place the right policy mechanisms for natural capital renewal. These challenges cannot be solved in isolation and therefore leading companies are calling for policies to unlock new business opportunities.⁹¹ In practical terms, this means:



1. Measure the right things

Understanding the real value of nature – and the hidden costs of nature-related risks – is critical to building a more resilient economy and financial system. We

must enhance our understanding of the interactions of different systems – such as the economic system, the food system and the climate system. We need to improve how we measure GDP and move decisively towards a multi-indicator understanding of economic performance and health. While physical capital doubled over the past 20 years and human capital grew by 13%, natural capital across 140 countries declined in value by nearly 40%.⁹²

Integrating natural capital accounting into government budgets and public procurement processes could help monitor and therefore manage natural capital stocks. It would also support the business case to invest in cost-effective natural infrastructure such as wetland ecosystems – reducing the impact of climate-related natural disasters. Natural capital accounting would also help the financial sector to better price the risk of natural capital depletion. This should be reflected on the balance sheets of companies in the same way that international oil companies must measure and regularly update their economically recoverable reserves. Understanding climate- and nature-related risks to assets and portfolios will be vital to shifting private capital into more resilient and regenerative business-models.

The Task Force on Climate-Related Financial Disclosures (TCFD) has developed recommendations for corporates to disclose climate-related risks. Agriculture, food and forest products are on the list of target sectors, but less than 50% of companies in these sectors disclose as recommended by the TCFD, and only 20% report board-level oversight of climate-related risks.⁹³ Making this mandatory will help. So, too, will tying stimulus and bailouts to TCFD disclosure, as exemplified recently in Canada, where large businesses seeking support to survive the COVID-19 crisis must publish annual climate disclosure reports, including how future operations will support environmental sustainability and national climate goals.⁹⁴ The first report in the *New Nature Economy* series – *Nature Risks Rising* – argued that companies must acknowledge, assess and disclose their exposure to nature-loss risk in just the same way they are starting to do for climate-related risks. The post-COVID recovery packages could make these requirements explicit, speeding up the process significantly.





2. Deploy spatial planning

Few countries systematically apply spatial planning tools. But governments cannot effectively manage marine and terrestrial assets without knowing where those stocks lie and demarcating their specific uses and rights. One interesting terrestrial example is in China, where land maps are used extensively. Starting with large-scale restoration programmes, China has mapped agriculture, biodiversity, ecosystem services and natural disaster risk to identify areas that require protection, restoration and sustainable management practices.⁹⁵ Applying spatial planning tools to prioritize conservation of zones with high ecological and/or climate value will become increasingly important to underpin greening of commodity supply chains⁹⁶ and the legitimacy of international investment such as China's effort to green its Belt and Road Initiative.⁹⁷

In marine ecosystems, national ocean governance is based on coastal states' jurisdiction over their 200 nautical mile exclusive economic zones (EEZs). To unlock a sustainable ocean economy, EEZs need to be 100% sustainably managed – balancing ocean use, and designating fully protected, ecologically sensitive areas totalling at least 30% of the ocean. That means using marine spatial planning tools to allocate ocean areas for different uses and activities (e.g. for transport, industry or MPAs). This will ultimately help reduce use conflicts and achieve economic, social and ecological objectives. Spatial planning on land and at sea must be accompanied with a clear legislative framework to unlock the dividends of a nature-positive economy.



3. Fix incentives

In most countries, the structure of public incentives is nature-negative. Combined with the failure to make polluters pay properly, perverse subsidy regimes create risks to public health, long-term food security and climate stability. For example, of more than \$700 billion paid in agricultural subsidies each year, only 15% of this support goes towards building public goods.^{98,99} Similarly, \$30 billion of public support is poorly targeted at fisheries, with around \$22 billion of this classified as harmful. Meanwhile, the total global fish catch has been in decline since the mid-1990s.¹⁰⁰ Many subsidy regimes undermine natural capital stocks, endangering long-term job stability and livelihoods. But *repurposing* and *reinvesting* that public support – for example, in regenerative agricultural practices – would help farmers to maximize productivity levels while reducing inputs, restoring soil health for future yields and ultimately safeguarding livelihoods.

Carbon pricing should also be introduced. Both Colombia and Costa Rica have implemented carbon taxes, and recently called on other tropical forest countries to do the same to plug the financing gap for conservation and restoration.¹⁰¹ Colombia's scheme – taxing liquid fossil fuels at \$5/tonne – yielded revenues of \$148 million in 2017 and \$91 million in 2018, with proceeds earmarked for rural development and deforestation-reduction programmes in conflict-affected areas. An offset mechanism was also established, enabling companies to reduce their tax burdens by buying certified carbon credits.¹⁰²



4. Enable innovation

The digital revolution could transform the way we manage the world's stock of natural capital. For example, precision agriculture tools – which combine data analysis on soil, weather and growing patterns with appropriate local modifications – can deliver more judicious use of inputs and better land management. Digital innovations are also critical for real-time monitoring of land use changes from afar, making it easier to identify deliberate deforestation, mining and other harmful activities. It has similar potential for policing the oceans. But technology in and of itself is not good for nature – in fact, it can increase the efficiency with which we deplete it. The Global Resources Outlook 2019 identified that global resource productivity has not improved in the past two decades despite significant technological advances in that time.¹⁰³ If technology is to support the nature-positive economy, then the right innovation ecosystem is needed – one in which policies encourage innovation resources (human, financial, digital) to flow towards major societal challenges, but also one that promotes inclusive forms of social innovation, tapping into multiple stakeholders and sharing the gains and know-how more equitably and openly.

Governments have a vital role to play in designing this “innovation ecosystem”, as they did in building the enabling conditions for the rapidly growing renewable energy industry over the past two decades.¹⁰⁴ They can set incentives to shape talent flows (e.g. providing financial and technical packages to support young people going into regenerative businesses); they can use regulation to tilt the playing field towards better societal outcomes (e.g. supporting the use of bio-inputs for farming); they can calibrate standards to accelerate new business models (e.g. incorporating green infrastructure standards into civil works codes); and, of course, they can deploy trillions of dollars of public procurement towards building a nature-

positive economy. The global surge in building with cross-laminated timber, and other mass timber technologies for tall buildings, is one example of how market incentives combined with removing regulatory barriers can contribute to diversified rural economies and support sustainable forest management. Government support is also essential to ensure that data architectures are kept open, especially when public funds have been used to generate the datasets and search tools, making it possible for a new wave of digital nature-based entrepreneurs to emerge and scale. While R&D spending matters hugely in stimulating the upfront pipeline of new ideas and technologies, the design of the full innovation ecosystem in terms of the big societal challenges may turn out to be at least as big an impact lever.



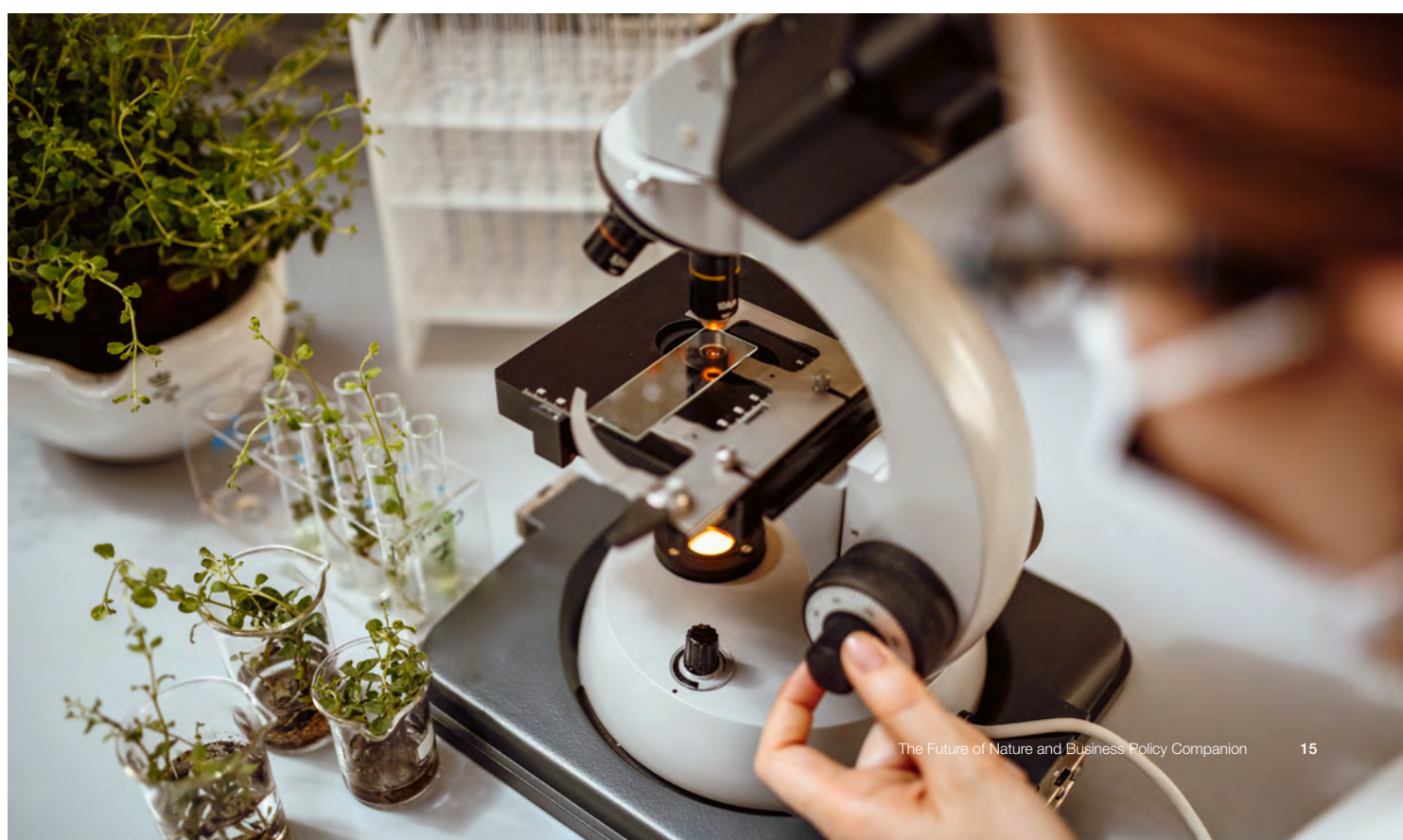
5. Invest in human capital

The *Future of Nature and Business* makes the case for huge job creation potential from the new nature economy. The challenge is for governments to support people of all ages, but especially younger people, to develop the skills and entrepreneurial mindset required to seize these opportunities. For example, building liveable cities will require skills of all levels: engineers and urban planners to integrate green design; technicians to fix green roofs; and arborists and groundskeepers to maintain city trees and parks. Similarly, in more rural settings, reforestation large landscapes engages those who grow, plant and maintain seedlings and trees; monitor and manage

forests; develop reforestation projects; use heavy machinery to prepare sites; and manage wildland fire prevention. However, good new jobs, whether in regenerative forestry or agriculture or greening cities, will not appear spontaneously. They can grow rapidly by combining new e-learning tools, coupled with targeted extension services, strong workforce incubator programmes and traditional learning-by-doing apprenticeships to engage more youth. These can take many forms, from iconic government-led efforts such as the Civilian Conservation Corps in the US to private-sector initiatives. The nature-positive economy is rich with lasting, local jobs – but they require training, wraparound services and nurturing to reach their true potential.

The experience of COVID-19 has held up a magnifying glass to the fragility and inequality of our current human capital model. The fallout of this crisis underlines the need for continued investment in human capital to lay the foundations of a more resilient society. It has also shown us that creating dangerous, low-paying jobs throughout the economy – from agriculture to the meat industry to healthcare to waste management – is a recipe for public health and economic vulnerability.

Nature-positive investments can play a vital role in human capital development, not least by creating a healthier environment in which families can bring up their children. But it needs to be combined with an equivalent commitment to policies and market practices that result in decent wages and social protection for workers across the economy.





6. Unlock capital markets

The agenda proposed in this report requires investment – and while stimulus finance can set economies on the pathway to nature-positive economies, any investment needs to be sustained. Market failures, early-stage funding gaps and short-term financing cycles make such investments difficult, especially for regenerative business models, which often have longer pay-off periods. The lack of bankable, large-scale projects and nascent business models also limits the investor attractiveness of nature as an asset class. These issues are compounded in emerging markets by perceptions of political, regulatory and currency risk, weaker local capital markets, information asymmetries and limited data.

Governments (and foundations) have a range of instruments with which to tackle these market failures, making it easier to mobilize private capital. First, they can deploy catalytic instruments to mitigate investor risk. For example, the United States Agency for International Development (USAID)'s partial credit risk guarantee instrument has been particularly effective at mobilizing capital for nature-

based solutions. The Tropical Landscape Finance Facility issued the world's first \$95 million sustainable land-use bond for a conservation-friendly rubber plantation in Indonesia, tapping mainstream capital markets thanks to the guarantee. Second, they can strengthen the use of market mechanisms – most obviously carbon markets – as a way to finance natural capital assets. We are already seeing a significant growth in the interest of private actors in financing “green carbon” – whether in forests, peatlands or mangroves. These markets have the potential to scale to billions of dollars of financing for nature over the coming decade. Third, governments can take creative approaches to corporate and sovereign (COVID-19-related) refinancing events, whether by insisting that companies put in place appropriate investments and reporting for a nature-positive economy or, in the case of sovereigns, supporting important policy reforms and/or enabling debt-for-nature swaps. The pricing of sustainability-linked loans and bonds in the capital markets suggests that investors are increasingly positive about the economic returns on nature, whether in terms of value creation or risk management. Governments should take full advantage of these market trends in their public financing strategies.



4 Conclusion

In the global financial crisis of 2007–2008, there were many conversations about the value of a green recovery but relatively little action. Instead, the economy grew throughout the 2010s on an unbalanced, unstable basis, with too much debt, increasing inequality and further depletion of natural capital, accompanied by the build-up of greenhouse gas stocks in the atmosphere and growing exposure to pandemic risk, notwithstanding a series of early-warning signals.

This time must be different. Governments – together with the private sector – have the opportunity and moral responsibility to use their fiscal recovery programmes to reset the economy on more resilient, inclusive and sustainable terms: opportunity, because the real economy and the financial markets are changing; responsibility, because such a reset is essential for the well-being and security of citizens – and that of future generations. There is an evolved appreciation of nature – and clean, low-carbon

technologies in general – as a source of value creation and risk mitigation. And smart private money is flowing in this direction, with ESG and low-carbon funds significantly outperforming general indices and the arrival of multiple zero-carbon and nature-positive unicorns.¹⁰⁵

This report makes the economic case that governments should make nature-positive investments a central, strategic plank of their economic recovery packages. Science has never been clearer – and the voice of citizens has never been louder – that we are reaching irreversible tipping points in key biomes of the planet that keep the balance of all life on Earth intact. There is an urgent need for change to ensure that there is equity in our societies and harmony with the ecosystem so that we leave behind a stable and healthy planet for future generations. What is required is bold policy ambition and decisive political leadership to send a signal that business-as-usual is no longer viable.



Acknowledgements

The World Economic Forum would like to acknowledge the valuable contributions of the following people in the development of this document:

World Economic Forum

Justin Adams

Executive Director, Tropical Forest Alliance and
Co-director Nature Based Solutions

Nicole Schwab

Co-director Nature Based Solutions

Akanksha Khatri

Head, Nature Action Agenda

Marco Albani

Senior External Adviser, New Nature Economy

Alexia Semov

Project Specialist, New Nature Economy Report

Kimberly Nicole Pope

Project and Community Lead, New Nature Economy

Editing and design

Janet Hill

Head of Editing

Floris Landi

Design Lead

SYSTEMIQ

Jeremy Oppenheim

Founder and Senior Partner

Danielle Gent

Head of Policy and Partnerships, Food and Land
Use Coalition

Amy Paterson

Chief of Staff to Jeremy Oppenheim

Scarlett Benson

Programme Manager, Food and Land Use Coalition

Henry Gilks

Economist, Food and Land Use Coalition

Contact

For questions about the New Nature Economy series of publications, contact:
Akanksha Khatri (akanksha.khatri@weforum.org) and
Alexia Semov (alexia.semov@weforum.org)

Experts consulted

Thanks also go to the many, leading academic, industry, NGO and government agency experts who provided invaluable perspectives

Katherine Stodulka, Programme Director,
Blended Finance Taskforce

Shenggen Fan, Chair Professor,
China Agricultural University

Seema Arora, Deputy Director General,
Confederation of Indian Industry

Sebastian Troëng, Executive Vice-President,
Global Conservation, Conservation International

Federico Bellone, Nature Based Solutions team,
High Level Champions to COP26

Daniela Göhler, Team Lead International Forest/
Climate Finance Programme, Deutsche Gesellschaft
für Internationale Zusammenarbeit (GIZ)

Claudia Martinez, E3 Asesorias, Food and Land
Use Coalition Colombia

Carlos Manuel Rodriguez Echandi, Minister of Environment and Energy, Government of Costa Rica

Per Fredrik Ilsaas Pharo, Director, International Climate and Forest Initiative, Government of Norway

Emma Howard-Boyd, Chair of the Environment Agency, Government of United Kingdom

Janez Potočnik, Chair, International Resource Panel

Sharan Burrow, General Secretary of the International Trade Union Confederation

Alison Tate, Director of Economic and Social Policy, International Trade Union Confederation

Nicholas Stern, IG Patel Chair of Economics and Government, London School of Economics

Jon Hutton, Director, Luc Hoffman Institute

André Hoffmann, Board Director, MAVA Foundation

Katie McCoy, Senior Manager, External Relations & Knowledge, Partnerships for Forests

Johan Rockström, Director, Potsdam Institute for Climate Impact (PIK)

Morten Rossé, Partner, SystemIQ

Guido Schmidt-Traub, Executive Director, UN Sustainable Development Solutions Network

Dimitri Zenghelis, Special Advisor, Bennett Institute for Public Policy, University of Cambridge

Jason Eis, Executive Director, Vivid Economics

Diane Banino Holdorf, Managing Director, Food and Nature, World Business Council for Sustainable Development

Helen Ding, Senior Economist, World Resources Institute

Leo Horn-Phathanothai, Director, Strategy and Partnerships, Ross Center For Sustainable Cities, World Resources Institute

Andrew Steer, President and Chief Executive Officer, World Resources Institute

Graham Wynne, Distinguished Senior Fellow, World Resources Institute

Marco Lambertini, Director General, WWF International

Endnotes

- 1 Vivid Economics. 2020. Greenness for Stimulus Index. London: Vivid Economics. <https://www.vivideconomics.com/casestudy/greenness-for-stimulus-index/> (link as of 7/7/20).
- 2 Bloomberg. 2020. How to Grow Green. 9 June 2020. <https://www.bloomberg.com/features/2020-green-stimulus-clean-energy-future/?sref=Oz9Q3OZU#toaster> (link as of 7/7/20).
- 3 WWF. 2020. Covid-19: Urgent Call to Protect People and Nature. 17 June 2020. <https://www.worldwildlife.org/publications/covid19-urgent-call-to-protect-people-and-nature> (link as 8/7/20).
- 4 Sir P Dasgupta. 2020. The Dasgupta Review: Independent Review on the Economics of Biodiversity – Interim Report. London: HM Treasury. <https://www.gov.uk/government/publications/interim-report-the-dasgupta-review-independent-review-on-the-economics-of-biodiversity> (link as of 7/7/20).
- 5 World Economic Forum. 2020. Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy. <https://www.weforum.org/reports/nature-risk-rising-why-the-crisis-engulfing-nature-matters-for-business-and-the-economy> (link as of 7/7/20).
- 6 World Economic Forum. 2020. The Future of Nature and Business. http://www3.weforum.org/docs/WEF_The_Future_Of_Nature_And_Business_2020.pdf (link as of 9/7/20).
- 7 Vivid Economics. 2020. Greenness for Stimulus Index. London: Vivid Economics.
- 8 S Pilgrim and JN Pretty (eds). 2010. Nature and Culture: Rebuilding Lost Connections. London: Earthscan.
- 9 Business for Nature coalition. June 2020. Engage for Nature: Steps Your Company Can Take Now. <https://www.businessfornature.org/s/Engage-for-Nature.pdf> (link as of 14/7/20).
- 10 Global Carbon Project. 2011. Rapid Growth in CO2 Emissions after the 2008–2009 Global Financial Crisis. Nature Climate Change. 4 December 2011. https://www.globalcarbonproject.org/global/pdf/pep/Peters_2011_Budget2010.pdf (link as of 7/7/20).
- 11 BA Jones, D Grace, R Kock, S Alonso, J Rushton, MY Said, D McKeever, F Mutua, J Young, J McDermott and DU Pfeiffer. 2013. Zoonosis Emergence Linked to Agricultural Intensification and Environmental Change. PNAS 110 (21), 8399–8404. <https://www.pnas.org/content/110/21/8399> (link as of 7/7/20).
- 12 T Allen, KA Murray, C Zambrana-Torrel et al. 2017. Global Hotspots and Correlates of Emerging Zoonotic Diseases. Nature Communications 8, 1124. <https://doi.org/10.1038/s41467-017-00923-8> (link as of 7/7/20).
- 13 McKinsey Global Institute. 2020. Will the World's Breadbaskets Become Less Reliable? 18 May 2020. <https://www.mckinsey.com/business-functions/sustainability/our-insights/will-the-worlds-breadbaskets-become-less-reliable> (link as of 7/7/20).
- 14 World Health Organization (WHO). Air Pollution. https://www.who.int/health-topics/air-pollution#tab=tab_1 (link as of 7/7/20).
- 15 UN Department of Economic and Social Affairs (UNDESA). 2019. World Urbanization Prospects: The 2018 Revision. New York: UNDESA. <https://population.un.org/wup/Publications/Files/WUP2018-Report.pdf> (link as of 7/7/20).
- 16 M Shepley, N Sachs, H Sadatsafavi, C Fournier and K Peditto. 2019. The Impact of Green Space on Violent Crime in Urban Environments. International Journal of Environmental Research and Public Health 16, 5119. <https://www.mdpi.com/1660-4601/16/24/5119/pdf> (link as of 7/7/20).
- 17 WHO guidelines recommend that to maximize equity in the health benefits of green space, all households should as a minimum have a publicly accessible green space of 0.5 hectares or larger within 300 metres of their home: World Health Organization. 2017. Urban Green Spaces: A Brief for Action. https://www.euro.who.int/__data/assets/pdf_file/0010/342289/Urban-Green-Spaces_EN_WHO_web3.pdf%3Fua=1 (link as of 14/7/20).

- 18 Stockholm Environment Institute (SEI). 2020. Lockdown Highlights the Value of Green Space in Cities. SEI Perspectives. <https://www.sei.org/perspectives/covid19-value-of-green-space-in-cities/> (link as of 7/7/20).
- 19 UK Parliament POST. 2016. POSTnote 538:Green Space and Health. London: UK Parliament. <https://post.parliament.uk/research-briefings/post-pn-0538/> (link as of 7/7/20).
- 20 ESSEC Chair for Real Estate and Sustainable Development. 2016. Investigating the Positive Impacts of Green Spaces on Wellbeing. ESSEC Knowledge. <http://knowledge.essec.edu/en/sustainability/investigating-positive-impacts-green-spaces-wellbe.html> (link as of 7/7/20).
- 21 Cities 100. 2019. 100 City Projects Making the Case for Climate Action. https://issuu.com/nordicsustainability/docs/cities100_2019_report (link as of 7/7/20).
- 22 J Lundholm. 2015. The Ecology and Evolution of Constructed Ecosystems as Green Infrastructure. *Frontiers in Ecology and Evolution*. <https://www.frontiersin.org/articles/10.3389/fevo.2015.00106/full> (link as of 7/7/20).
- 23 UK Environment Agency (EA). 2018. Environment Agency Completes £10 million Flood Storage Basin on World Wetlands Day. Press Release, 2 February 2018. <https://www.gov.uk/government/news/environment-agency-completes-10-million-flood-storage-basin-on-world-wetlands-day> (link as of 7/7/20).
- 24 Market Reports World. 2020. Global Green Roofs and Walls Market Research Report 2020. Market Reports World. <https://www.marketreportsworld.com/global-green-roofs-and-walls-market-14350691> (link as of 7/7/20).
- 25 P Newman. 2014. Biophilic Urbanism: A Case Study on Singapore. *Australian Planner* 51 (1), 47–65. <https://doi.org/10.1080/07293682.2013.790832> (link as of 7/7/20).
- 26 Ellen MacArthur Foundation. 2019. Circular Economy in Cities: Urban Buildings System. https://www.ellenmacarthurfoundation.org/assets/downloads/Buildings_All_Mar19.pdf (link as of 8/7/20).
- 27 B Ferguson. 2012. Permeable Pavements in Liveable, Sustainable Cities. *CityGreen*. July 2012. https://www.nparks.gov.sg/-/media/cuge/ebook/citygreen/cg5/cg5_03.pdf (link as of 7/7/20).
- 28 G Lennox, T Gardner, J Thomson et al. 2018. Second Rate or a Second Chance? Assessing Biomass and Biodiversity Recovery in Regenerating Amazonian Forests. *Global Change Biology* 24, 5680–5694. <https://doi.org/10.1111/gcb.14443> (link as of 7/7/20).
- 29 SL Lewis, CE Wheeler, ETA Mitchard and A Koch. 2019. Restoring Natural Forests is the Best Way to Remove Atmospheric Carbon. *Nature*, 568, 25–28. <https://www.nature.com/articles/d41586-019-01026-8> (link as of 9/7/20).
- 30 World Resources Institute (WRI). 2019. We Lost a Football Pitch of Primary Rainforest Every 6 Seconds in 2019. <https://www.wri.org/blog/2020/06/global-tree-cover-loss-data-2019#:~:text=Nearly%20a%20third%20of%20that,seconds%20for%20the%20entire%20year> (link as of 14/7/20).
- 31 M Konar and H Ding, 2020. A Sustainable Ocean Economy for 2050: Approximating Its Benefits and Costs. Washington, DC: Secretariat of the High Level Panel for a Sustainable Ocean Economy, World Resources Institute.
- 32 P Smith, M Bustamante et al. 2014. “Agriculture, Forestry and Other Land Use (AFOLU)” in *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, ed. O Edenhofer, R Pichs-Madruga, Y Sokona, E Farahani, S Kadner, K Seyboth, A Adler, I Baum, S Brunner, P Eickemeier, B Kriemann, J Savolainen, S Schlömer, C von Stechow, T Zwickel and JC Minx, 811–922. Cambridge, UK, and New York: Cambridge University Press, cited by F Seymour and J Busch. 2016. *Why Forests? Why Now? The Science, Economics, and Politics of Tropical Forests and Climate Change*. Washington, DC: Brookings Institution Press.
- 33 G van der Werf et al. 2009. Estimates of Fire Emissions from an Active Deforestation Region in the Southern Amazon Based on Satellite Data and Biogeochemical Modelling. *Biogeosciences* 2 (6), 235–249; J Grace, E Mitchard, and E Gloor. 2014. Perturbations in the Carbon Budget of the Tropics. *Global Change Biology* 20, 3238–3255. <https://doi.org/10.1111/gcb.12600>; J Busch and J Engelmann. 2015. The Future of Forests: Emissions from Tropical Deforestation with and without a Carbon Price, 2016–2050. CGD Working Paper 411. Washington, DC: Center for Global Development. <http://www.cgdev.org/publication/future-forests> (link as of 7/7/20).

- 34 MA Verdone and A Seidl. 2017. Time, Space, Place and the Bonn Challenge Global Forest Restoration Target. *Restoration Ecology* 25, 903–911. <https://doi.org/10.1111/rec.12512>. (link as of 9/7/20). Cited in *Roots of Prosperity: The Economics and Finance of Restoring Land*. Washington, DC: World Resources Institute.
- 35 Asian Development Bank (ADB). 2020. COVID-19 Economic Impact Could Reach \$8.8 Trillion Globally – New ADB Report. News Release, 15 May 2020. <https://www.adb.org/news/covid-19-economic-impact-could-reach-8-8-trillion-globally-new-adb-report> (link as of 7/7/20).
- 36 Global Commission on Adaptation (GCA). 2019. Adapt Now: A Global Call for Leadership on Climate Resilience. GCA. https://cdn.gca.org/assets/2019-09/GlobalCommission_Report_FINAL.pdf (link as of 7/7/20).
- 37 A Waldron et al. July 2020, Protecting 30% of the Planet for Nature: Costs, Benefits and Economic Implications https://static1.squarespace.com/static/5c77fa240b77bd5a7ff401e5/t/5f05d15ea8b84f56b02509b2/1594216800710/Waldron_Report_FINAL_sml.pdf (link as of 9/7/20).
- 38 B Wehrmann and J Wettengel. 2020. Germany Gives Energy Transition Mild Boost with Economic Stimulus Programme. *Clean Energy Wire*. 4 June 2020. <https://www.cleanenergywire.org/news/germany-gives-energy-transition-some-extra-boost-economic-stimulus-programme> (link as of 7/7/20).
- 39 Government of New Zealand, Department of Conservation. 2020. Budget 2020 Will Create Almost 11,000 New Jobs in Regional New Zealand to Restore Our Environment. Press Release, 14 May 2020. <https://www.doc.govt.nz/news/media-releases/2020-media-releases/investment-to-create-11000-environment-jobs-in-our-regions/> (link as of 7/7/20).
- 40 The Times of India. 2020. World Bank to Provide \$188 Million to Pakistan to Address Environmental Degradation and Climate Change. 1 June 2020. <https://timesofindia.indiatimes.com/world/pakistan/world-bank-to-provide-188-million-to-pakistan-to-address-environmental-degradation-climate-change/articleshow/76143227.cms> (link as of 8/7/20).
- 41 A Balmford, J Beresford, J Green, R Naidoo and M Walpole. 2009. A Global Perspective on Trends in Nature- Based Tourism. *PLoS Biology* 7 (6), e1000144. <https://doi.org/10.1371/journal.pbio.1000144> (link as of 7/7/20).
- 42 Uniting Travel. 2018. Travel and Tourism: A Force for Good in the World. <https://www.icao.int/Meetings/iwaf2018/Documents/Travel%20and%20Tourism.pdf> (link as of 7/7/20).
- 43 A Spenceley et al. 2015. “Visitor Management” in *Protected Area Governance and Management*, eds G Worboys, M Lockwood, A Kothari, S Feary and I Pulsford, 715–750. Canberra: ANU Press.
- 44 A Balmford et al. 2015. Walk on the Wild Side: Estimating the Global Magnitude of Visits to Protected Areas. *PLoS Biology* 1–6. <https://doi.org/10.1371/journal.pbio.1002074> (link as of 7/7/20).
- 45 Organisation of Economic Co-operation and Development (OECD). 2018. “Costa Rica”, in *OECD Tourism Trends and Policies 2018*. Paris: OECD Publishing. <https://doi.org/10.1787/tour-2018-46-en>; <https://knoema.com/atlas/Costa-Rica/topics/Tourism/Travel-and-Tourism-Total-Contribution-to-GDP/Contribution-of-travel-and-tourism-to-GDP-percent-of-GDP> (link as of 7/7/20).
- 46 Costa Rica Information, Tourism Statistics. <http://costarica-information.com/about-costa-rica/economy/economic-sectors-industries/tourism/tourism-statistics> (link as of 7/7/20).
- 47 I Porras and A Chacón-Cascante. 2018. Costa Rica’s Payments for Ecosystem Services Programme. International Institute for Environment and Development. www.jstor.org/stable/resrep16747 (link as of 9/7/20).
- 48 BBC. 2020. Virus “Could Cost Millions of Tourism Jobs”. BBC News. 13 March 2020. <https://www.bbc.co.uk/news/business-51852505> (link as of 7/7/20).
- 49 African Union. 2020. Impact of the Coronavirus (COVID-19) on the African Economy. Addis Ababa: African Union. https://au.int/sites/default/files/documents/38326-doc-covid-19_impact_on_african_economy.pdf (link as of 7/7/20).
- 50 Food and Agriculture Organization (FAO). 2011. *Global Food Losses and Food Waste: Extent, Causes and Prevention*. Rome: FAO. <http://www.fao.org/3/a-i2697e.pdf> (link as of 7/7/20); M Kummu, H de Moel, M Porkka, S Siebert, O Varis and PJ Ward. 2012. Lost Food, Wasted Resources: Global Food Supply Chain Losses and Their Impacts on Freshwater, Cropland, and Fertiliser Use. *Science of the Total Environment* 438, 477–489. <https://doi.org/10.1016/j.scitotenv.2012.08.092> (link as of 7/7/20).

- 51 Food and Land Use Coalition (FOLU). 2019. Growing Better: Ten Critical Transitions to Transform Food and Land Use. London: FOLU. <https://www.foodandlandusecoalition.org/wp-content/uploads/2019/09/FOLU-GrowingBetter-GlobalReport.pdf> (link as of 7/7/20).
- 52 Food and Agriculture Organization (FAO). 2015. Food Wastage Footprint and Climate Change. Rome: FAO. <http://www.fao.org/documents/card/en/c/7338e109-45e8-42da-92f3-ceb8d92002b0/> (link as of 8/7/20).
- 53 European Commission. Critical Raw Materials. https://ec.europa.eu/growth/sectors/raw-materials/specific-interest/critical_en (link as of 7/7/20).
- 54 Circular economy business models keep products and materials in use, by design, for as long as possible to get the maximum value from them.
- 55 G Churkina, A Organschi, CPO Reyer, A Ruff, K Vinke, Z Liu, BK Reck, TE Graedel and HJ Schellnhuber. 2020. Buildings as a Global Carbon Sink. *Nature Sustainability* 3, 269–276. <https://doi.org/10.1038/s41893-019-0462-4> (link as of 7/7/20).
- 56 P Leskinen, G Cardellini, S Gonzalez-Garcia, E Hurmekoski, R Sathre, J Seppälä, C Smyth, T Stern, PJ Verkerk. 2018. Substitution Effects of Wood-Based Products in Climate Change Mitigation. *From Science to Policy* 7, European Forest Institute. <https://doi.org/10.36333/fs07> (link as of 7/7/20).
- 57 EFI, Circular Bioeconomy Offers Game-Changing Solutions. <https://www.efi.int/articles/circular-bioeconomy-offers-game-changing-solutions> (link as of 7/7/20).
- 58 Stora Enso. Towards a Circular Bioeconomy. <https://www.storaenso.com/en/sustainability/circular-bioeconomy> (link as of 7/7/20).
- 59 Stora Enso. Circular Design Guide for Packaging. <https://info.storaenso.com/signup-circular-design-guide> (link as of 7/7/20).
- 60 World Economic Forum. 2020. The Future of Nature and Business.
- 61 Ibid.
- 62 Confederation of Indian Industry. 2020. Atma Nirbhar (Self-Reliant) Bharat Abhiyan Economic Stimulus Package: An Analysis of Economic, Social and Environment Elements of the Package. Presentation.
- 63 World Resources Institute (WRI). 2019. Reducing Food Loss and Waste. Washington, DC: WRI. <https://apo.org.au/sites/default/files/resource-files/2019-08/apo-nid256366.pdf> (link as of 7/7/20).
- 64 The Good Food Institute. 2020. Record \$824 Million Invested in Alternative Protein Companies in 2019. Press Release, 13 May 2020. <https://www.gfi.org/record-investment-in-alternative-protein-in-2019-and-q1-2020-media-release> (link as of 7/7/20).
- 65 World Economic Forum. 2020. The Future of Nature and Business.
- 66 Frankfurt School of Finance and Management. 2019. Global Trends in Renewable Energy Investment. Frankfurt: Frankfurt School-UNEP Centre/BNEF. <https://wedocs.unep.org/bitstream/handle/20.500.11822/29752/GTR2019.pdf?sequence=1&isAllowed=y> (link as of 7/7/20).
- 67 International Renewable Energy Agency (IRENA). 2019. 11 Million People Employed in Renewable Energy Worldwide. Press Release, 13 June 2019. <https://www.irena.org/newsroom/pressreleases/2019/Jun/11-Million-People-Employed-in-Renewable-Energy-Worldwide-in-2018> (link as of 7/7/20).
- 68 Food and Land Use Coalition (FOLU). 2019. Growing Better: Ten Critical Transitions to Transform Food and Land Use. London: FOLU. <https://www.foodandlandusecoalition.org/wp-content/uploads/2019/09/FOLU-GrowingBetter-GlobalReport.pdf> (link as of 7/7/20).
- 69 Agrobiodiversity is the diversity of species, varieties and breeds of animals, plants and microorganisms used in agriculture to produce food. Agrobiodiversity reduces variability and uncertainty in yield and acts as a form of insurance or as a diverse portfolio that spreads risk.

- 70 United Nations Environment Programme (UNEP). 2019. Foresight Brief: Putting Carbon Back Where It Belongs – the Potential of Carbon Sequestration in the Soil. New York: UNEP. <https://wedocs.unep.org/bitstream/handle/20.500.11822/28453/Foresight013.pdf?sequence=1&isAllowed=y> (link as of 7/7/20).
- 71 Food and Agriculture Organization (FAO). 2012. Green Jobs for a Revitalized Food and Agriculture Sector. Rome: FAO. http://www.fao.org/fileadmin/user_upload/sustainability/pdf/FAO_green_jobs_paper_March_31.pdf (link as of 7/7/20).
- 72 Queensland Government. The Land Restoration Fund. <https://www.qld.gov.au/environment/climate/climate-change/land-restoration-fund/about> (link as of 7/7/20).
- 73 Zero Budget Natural Farming. <http://apzbnf.in/> (link as of 8/7/20).
- 74 Organisation for Economic Co-operation and Development (OECD). 2019. Agricultural Policy Monitoring and Evaluation 2019. Paris: OECD Publishing, Paris. <https://doi.org/10.1787/39bfe6f3-en> (link as of 7/7/20).
- 75 Department for Environment, Food and Rural Affairs (DEFRA). 2020. Agriculture Bill to Boost Environment and Food Production. Press release, 16 January 2020. <https://www.gov.uk/government/news/agriculture-bill-to-boost-environment-and-food-production> (link as of 7/7/20).
- 76 World Bank. 2018. The Greening of Farm Support Programs. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/827371554284501204/pdf/The-Greening-of-Farm-Support-Programs-International-Experiences-with-Agricultural-Subsidy-Reform.pdf> (link as of 7/7/20).
- 77 Food and Agriculture Organization (FAO). 2020. The State of World Fisheries and Aquaculture 2020. Rome: FAO. <http://www.fao.org/state-of-fisheries-aquaculture> (link as of 7/7/20).
- 78 C Costello, L Cao, S Gelcich et al. 2019. The Future of Food from the Sea. Washington, DC: World Resources Institute. https://oceanpanel.org/sites/default/files/2019-11/19_HLP_BP1%20Paper.pdf (link as of 8/7/20).
- 79 Mariculture is the farming of marine organisms for food and other products, either in the natural marine environment or in land- or sea-based enclosures.
- 80 M Phillips. 2009. Mariculture Overview. Encyclopedia of Ocean Sciences (Second Edition), 537–544. Elsevier. <https://www.sciencedirect.com/science/article/pii/B9780123744739007529> (link as of 7/7/20).
- 81 Innovation Norway. 2018. Seaweed Industry in China. Beijing: Innovation Norway. https://www.submariner-network.eu/images/grass/Seaweed_Industry_in_China.pdf (link as of 7/7/20).
- 82 SalMar. Offshore Fish Farming. <https://www.salmar.no/en/offshore-fish-farming-a-new-era/#:~:text=Ocean%20Farm%201%20%E2%80%93%20the%20world's,has%20now%20arrived%20at%20Frohavet.&text=Based%20on%20world%20class%20Norwegian,growth%20in%20the%20aquaculture%20industry> (link as of 8/7/20).
- 83 Royal Norwegian Embassy in Beijing. 2018. Collaboration on Development of Sustainable Aquaculture. News story, 4 April 2018. <https://www.norway.no/en/china/norway-china/news-and-events/beijing-news-and-events2/sustainable-aquaculture/> (link as of 7/7/20).
- 84 Marine Conservation Institute. 2019. Atlas of Marine Protection. <http://mpatlas.org> (link as of 7/7/20).
- 85 E Sala et al. 2020 Reconciling Biodiversity Protection, Food Production, and Climate Change Mitigation in the Global Ocean. (Revised manuscript submitted, Nature).
- 86 UN Forum on Forests. 2019. Forests, Inclusive and Sustainable Economic Growth and Employment (2019). <https://www.un.org/esa/forests/wp-content/uploads/2019/04/UNFF14-BkgdStudy-SDG8-March2019.pdf> (link as of 7/7/20).
- 87 Food and Land Use Coalition (FOLU). 2019. Prosperous Forests. London: FOLU. https://www.foodandlandusecoalition.org/wp-content/uploads/2019/11/FOLU-Prosperous-Forests_v6.pdf (link as of 7/7/20).
- 88 Food and Land Use Coalition (FOLU). 2019. Growing Better: Ten Critical Transitions to Transform Food and Land Use. London: FOLU. <https://www.foodandlandusecoalition.org/wp-content/uploads/2019/09/FOLU-GrowingBetter-GlobalReport.pdf> (link as of 7/7/20).

- 89 EC Kelly and MB Schmitz. 2016. Forest Offsets and the California Compliance Market: Bringing an Abstract Ecosystem Good to Market, *Geoforum* 75. <https://www.sciencedirect.com/science/article/pii/S0016718516301774> (link as of 7/7/20).
- 90 WWF. 2020. Covid-19: Urgent Call to Protect People and Nature. 17 June 2020. <https://www.worldwildlife.org/publications/covid19-urgent-call-to-protect-people-and-nature> (link as 8/7/20).
- 91 Business for Nature coalition. June 2020, Engage for Nature.
- 92 Capital measured on a per head basis between 1992 and 2014 across 140 countries. S Managi, and P Kumar. 2018. Inclusive Wealth Report 2018. London: DOI. <https://doi-org.stanford.idm.oclc.org/10.4324/9781351002080> (link as of 7/7/20).
- 93 Task Force on Climate-Related Financial Disclosures (TCFD). 2019 Status Report. <https://www.fsb.org/2019/06/task-force-on-climate-related-financial-disclosures-2019-status-report/#:~:text=Task%20Force%20on%20Climate%2Drelated%20Financial%20Disclosures%3A%202019%20Status%20Report,-Available%20as%3A%20PDF&text=The%20Status%20Report%20provides%20an,recommendations%20published%20in%20June%202017>. (link as of 7/7/20).
- 94 Environmental Finance. 2020. Canadian Firms Must File TCFD Reports to Get COVID-19 Bailout. Environmental Finance. <https://www.environmental-finance.com/content/news/canadian-firms-must-file-tcf-d-reports-to-get-covid-19-bailout.html> (link as of 7/7/20).
- 95 Food and Land Use Coalition (FOLU). 2019. Growing Better: Ten Critical Transitions to Transform Food and Land Use. London: FOLU. <https://www.foodandlandusecoalition.org/wp-content/uploads/2019/09/FOLU-GrowingBetter-GlobalReport.pdf> (link as of 7/7/20).
- 96 High Carbon Stock Approach. <http://highcarbonstock.org/> (link as of 7/7/20).
- 97 Green Belt and Road Initiative Center. <https://green-bri.org/> (link as of 7/7/20).
- 98 The amount of subsidies aimed at “public goods” is captured by the OECD definition of General Services Support Estimates, that is “public financing of services that create enabling conditions for the agricultural sector”.
- 99 Organisation of Economic Co-operation and Development (OECD). 2019. Agricultural Policy Monitoring and Evaluation 2019. Paris: OECD Publishing. <https://doi.org/10.1787/39bfe6f3-en> (link as of 7/7/20).
- 100 UR Sumaila et al. 2019. Updated Estimates and Analysis of Global Fisheries Subsidies. *Marine Policy* 109. <https://www.sciencedirect.com/science/article/pii/S0308597X19303677> (link as of 7/7/20).
- 101 E Barbier, R Lozano, CM Rodriguez and S Troeng. 2020. Adopt a Carbon Tax to Protect Tropical Forests. *Nature* 578, 213–216. <https://www.nature.com/articles/d41586-020-00324-w> (link as of 7/7/20).
- 102 Government of the Republic of Colombia. 2017. Decreto 926. 1 June 2017. <http://es.presidencia.gov.co/normativa/normativa/DECRETO%20926%20DEL%2001%20DE%20JUNIO%20DE%202017.pdf> (link as of 7/7/20).
- 103 International Resource Panel and United Nations Environment Programme. 2019. Global Resource Outlook 2019. <https://www.resourcepanel.org/reports/global-resources-outlook> (link as of 7/7/20).
- 104 IEA, Renewable Energy Market Update: Outlook for 2020 and 2021. May 2020. <https://www.iea.org/reports/renewable-energy-market-update> (link as of 9/7/20).
- 105 Morningstar Manager Research, 2020, How Does European Sustainable Funds’ Performance Measure Up?



COMMITTED TO
IMPROVING THE STATE
OF THE WORLD

The World Economic Forum, committed to improving the state of the world, is the International Organization for Public-Private Cooperation.

The Forum engages the foremost political, business and other leaders of society to shape global, regional and industry agendas.

World Economic Forum
91-93 route de la Capite
CH-1223 Cologny/Geneva
Switzerland

Tel.: +41 (0)22 869 1212
Fax: +41 (0)22 786 2744

contact@weforum.org
www.weforum.org