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IN BRIEF

THE STATE OF **THE WORLD'S FORESTS**

**FOREST PATHWAYS FOR GREEN RECOVERY
AND BUILDING INCLUSIVE, RESILIENT
AND SUSTAINABLE ECONOMIES**

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COVER PHOTOGRAPH ©FAO/Saikat M.

MYANMAR. A Rohingya refugee volunteer watering plants inside a refugee camp in Cox's Bazar. He has been engaged with FAO's planting activities aimed at restoring degraded forests since 2018.

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FOREWORD

The COVID-19 pandemic has made the eradication of hunger and poverty both more challenging and more urgent. Recovery needs to address the impacts of the pandemic and related containment measures, which have hit vulnerable people especially hard.

Even before the pandemic, much of humanity's progress had come at considerable cost to the environment. A combination of intensified agricultural production processes and the clearing of forests to produce ever more food and other agricultural goods has led to environmental degradation and is contributing to the climate crisis. Continuing along current agrifood production pathways is unviable.

Transformation of global agrifood systems has started, as evidenced by the 2021 United Nations Food Systems Summit and related initiatives. There is a need to recover both from a short-term crisis – the human health pandemic – and the longer and deeper emergency caused by a “planetary health” crisis.

There are alternative pathways for the future of food and agriculture that should be considered. FAO has done this through its Strategic Framework 2022–31 around the four fundamental aspirations of “better production”, “better nutrition”, “a better environment” and “a better life for all – leaving no one behind”. FAO has also put forward a vision for sustainable agrifood systems based on five principles and 20 interrelated actions, applicable across sectors and scales.

In this report, we explore three forest and tree-based pathways that complement other actions aimed at achieving more efficient, more inclusive, more resilient and more sustainable agrifood systems, namely: halting deforestation and maintaining forests; restoring degraded lands and expanding agroforestry; and sustainably using forests and building green value chains. The balanced, simultaneous pursuit of these pathways can help address the crises facing people and the planet while also generating sustainable economic benefits, especially in (often remote) rural communities. Forests and trees are valuable assets that, through the forest pathways, can support recovery and build more resilient local economies. The pathways are set out on the premise that

solutions to interrelated planetary crises have economic, social and environmental implications that need to be addressed holistically.

Overall, the outcomes of the 2021 Glasgow Climate Change Conference supported all three of the forest pathways. More than 140 countries have pledged, through the Glasgow Leaders' Declaration on Forests and Land Use, to eliminate forest loss by 2030 and to support restoration and sustainable forestry. To this end, an additional USD 19 billion has been allocated to help developing countries achieve these objectives. The area of forest and farm landscapes managed by family farmers, smallholders, forest communities and Indigenous Peoples exceeds 4 billion hectares, and these actors are crucial for the effective implementation of the pathways.

This report sets out the steps by which the world can further pursue the three forest pathways, a green recovery and the move towards more circular economies. There is no time to lose – we need to act now to keep the global temperature increase below 1.5 °C, reduce the risk of future pandemics, ensure food security and nutrition for all, eliminate poverty, conserve the planet's biodiversity and offer young people hope of a better world and a better future for all. FAO is committed to supporting Member Nations explore the potential of the three forest pathways for further investment and effective implementation, in close collaboration with partners.



Qu Dongyu
FAO Director-General

Headlines

There will be no healthy economy on an unhealthy planet. Environmental deterioration is contributing to climate change, biodiversity loss and the emergence of new diseases. Forests and trees can play crucial roles in addressing these crises and moving towards sustainable economies.

Three interrelated pathways involving forests and trees can support economic and environmental recovery. These are (1) halting deforestation and maintaining forests; (2) restoring degraded lands and expanding agroforestry; and (3) sustainably using forests and building green value chains.

The world will need more renewable materials because of a growing population and the need to reduce environmental impacts. The forest sector can and must drive a transition to the more efficient and circular use of biomaterials with higher value added.

Forest and farm producers need more incentive to scale up green recovery. They must derive substantial tangible benefits from restoring and sustainably managing forest and tree resources.

The forest pathways can contribute to building inclusive, resilient and sustainable economies. Doing so optimally will require shifts in policies to maximize synergies among the pathways and between agriculture and forestry across agrifood systems and to encourage private-sector investments.

KEY MESSAGES

→ **Trees, forests and sustainable forestry can help the world recover from the COVID-19 pandemic and combat looming environmental crises such as climate change and biodiversity loss.** But this requires societies to better recognize the considerable value of forests and their crucial roles in building inclusive, resilient and sustainable economies.

→ **Three pathways involving forests and trees offer means by which societies, communities and individual landowners, users and managers can derive more tangible value from forests and trees** while addressing environmental degradation, recovering from crises, preventing future pandemics, increasing resilience and transforming economies:

1. *Halting deforestation and maintaining forests* could avoid emitting 3.6 +/- 2 gigatonnes of carbon dioxide equivalent (GtCO₂e) per year between 2020 and 2050, including about 14 percent of what is needed up to 2030 to keep planetary warming below 1.5 °C, while safeguarding more than half the Earth's terrestrial biodiversity.
2. *Restoring degraded lands and expanding agroforestry* – 1.5 billion ha of degraded land would benefit from restoration, and increasing tree cover could boost agricultural productivity on another 1 billion ha. Restoring degraded land through afforestation and reforestation could cost-effectively take 0.9–1.5 GtCO₂e per year out of the atmosphere between 2020 and 2050.

3. *Sustainably using forests and building green value chains* would help meet future demand for materials – with global consumption of all natural resources expected to more than double from 92 billion tonnes 2017 to 190 billion tonnes in 2060 – and underpin sustainable economies.

→ **The three pathways are mutually reinforcing.** When synergies are maximized, the pathways can provide some of the highest returns in the form of climate and environmental benefits while also enhancing local sustainable development potential, adaptive capacity and resilience.

→ **Shifts in policies are needed to divert financial flows away from actions that harm forests and to incentivize investment in conservation, restoration and sustainable use.** Finance for the three forest pathways needs to at least triple (to more than USD 200 billion per year for forest establishment and management alone) by 2030 to meet climate, biodiversity and land degradation neutrality targets.

→ **Smallholders, local communities and Indigenous Peoples own or manage nearly half – 4.35 billion ha – of the world's forest and farm landscapes and will be crucial for scaling up implementation of the pathways.** According to one estimate, smallholders on such lands generate a gross annual income of up to USD 1.29 trillion. More than 8.5 million producer organizations now exist to help local actors participate in and support a green recovery.

→ **Companies in forest-based value chains will be essential partners in the development of circular economies.** Many are already expanding the range of forest products as substitutes for materials with higher greenhouse-gas emissions and increasing processing efficiency. Local forest growers and processors can obtain more benefit by strengthening links with buyers and developing capacity through producer organizations.

→ **Scaling up action on the three forest pathways carries risks, especially for smallholders, whose investments in them could fail in the absence of supportive policies and institutions.** Risks associated with climate change, such as increased vulnerability to fire, pests and drought, also need to be managed.

→ **Starting points for moving swiftly along the pathways** may include:

1. directing funding for recovery towards long-term policies aimed at creating sustainable and green jobs and further mobilizing private-sector investment;
2. empowering and incentivizing local actors, including women, youth and Indigenous Peoples, to take a leading role in the forest pathways;
3. engaging in awareness raising and policy dialogue on sustainable forest use as a means for simultaneously achieving economic and environmental goals; and
4. maximizing synergies among the three forest pathways and between agricultural, forestry, environmental and other policies and minimizing trade-offs.

SUMMARY

1 – CAN FORESTS AND TREES PROVIDE MEANS FOR RECOVERY AND INCLUSIVE, RESILIENT AND SUSTAINABLE ECONOMIES?

Humanity is facing multiple global threats.

- These include a pandemic and related economic hardship, food insecurity, poverty, climate change, conflicts, land and water degradation, and biodiversity loss.

The world needs solutions at scale that are cost-effective and equitable and can be implemented rapidly, and forests and trees have clear potential.

- Societies could make better use of forests and trees to simultaneously conserve nature, better provide for human well-being, and generate income, particularly for rural people.

Three forest-based pathways warrant close examination as means for tackling local to global challenges.

- These are:
 1. halting deforestation and maintaining forests;
 2. restoring degraded lands and expanding agroforestry; and
 3. sustainably using forests and building green value chains.

- This report outlines the roles and values of forests and trees; examines the benefits and costs of the pathways and ways of integrating them into existing and emerging policies; assesses the potential for additional finance for the pathways; and explores how best to enable and scale up adoption, where appropriate, by decision-makers at the national level and on the ground.

2 – FORESTS AND TREES PROVIDE VITAL GOODS AND ECOSYSTEM SERVICES BUT ARE UNDERVALUED IN ECONOMIC SYSTEMS

Forests are resources of global significance.

- They cover 31 percent of the Earth's land surface (4.06 billion ha) but the area is shrinking, with 420 million ha of forest lost through deforestation between 1990 and 2020. The rate of deforestation is declining but was still 10 million ha per year in 2015–2020. Some 47 million ha of primary forests was lost between 2000 and 2020.
- Planted forests cover 294 million ha (7 percent of the global forest area), with the area increasing by a rate of just under 1 percent per year in 2015–2020, down from 1.4 percent per

year in 2010–2015. The area of other wooded land fell by nearly 1 percent between 2000 and 2020, but the area of other land with tree cover (comprising trees in urban settings, tree orchards, palms and agroforestry landscapes) increased by more than one-third between 1990 and 2020. There is at least 45 million ha of agroforestry land, with an increasing trend.

- Forests provide habitat for 80 percent of amphibian species, 75 percent of bird species and 68 percent of mammal species, and tropical forests contain about 60 percent of all vascular plant species. More than 700 million ha of forest (18 percent of the total forest area) is in legally established protected areas. Nevertheless, forest biodiversity remains under threat from deforestation and forest degradation.
- Climate change is a major risk factor for forest health. For example, there are indications that the incidence and severity of forest fires and pests are increasing.

Forests are crucial for mitigating climate change.

- Trees and forests are major means for combating climate change. Forests contain 662 billion tonnes of carbon, which is more than half the global carbon stock in soils and vegetation. Despite a continued reduction in area, forests absorbed more carbon than they emitted in 2011–2020 due to reforestation, improved forest management and other factors.

- Forests have a range of other impacts on climate change, such as by affecting albedo and atmospheric water vapour and emitting aerosols. Deforestation in the Amazon and African tropics could have major regional impacts on rainfall and therefore on rainfed agriculture. The local to regional impacts of forests on climatic conditions can be important; for example, trees in urban areas reduce land surface temperatures in Central Europe in summer and during heat extremes by as much as 12 °C.

Societies benefit from and are highly dependent on forests.

- It is estimated that more than half of world gross domestic product (USD 84.4 trillion in 2020) depends moderately (USD 31 trillion per year) or highly (USD 13 trillion per year) on ecosystem services, including those provided by forests.
- The wealth represented by certain forest ecosystem services (recreation and hunting, habitat, the provision of non-timber forest products, and water services) is estimated at USD 7.5 trillion, which is 21 percent of the total wealth in land assets and about 9 percent of world gross domestic product. The absence of natural asset stock in national wealth accounting risks policy errors, with a decline in natural assets likely to affect other assets in the longer term. Efforts are underway to improve estimates of the value of nature, including forests.

- About 33 million people – 1 percent of global employment – are estimated to work directly in the formal and informal forest sector. The sector contributed (directly, indirectly and induced) more than USD 1.52 trillion to world gross domestic product in 2015.
- One-third of the global population (about 2.6 billion people) relies on wood and other traditional fuels for household cooking. Traditional woodfuel, however, is a significant contributor to household air pollution, which is responsible for 1.63 million–3.12 million premature deaths per year.
- One study estimates that 3.5 billion–5.76 billion people use non-timber forest products for own use or to support livelihoods. Wild-harvested forest foods add to the food security and nutrition of forest-adjacent people, especially in remote areas in the tropics and subtropics.

Many forest-proximate people obtain insufficient benefits from forests.

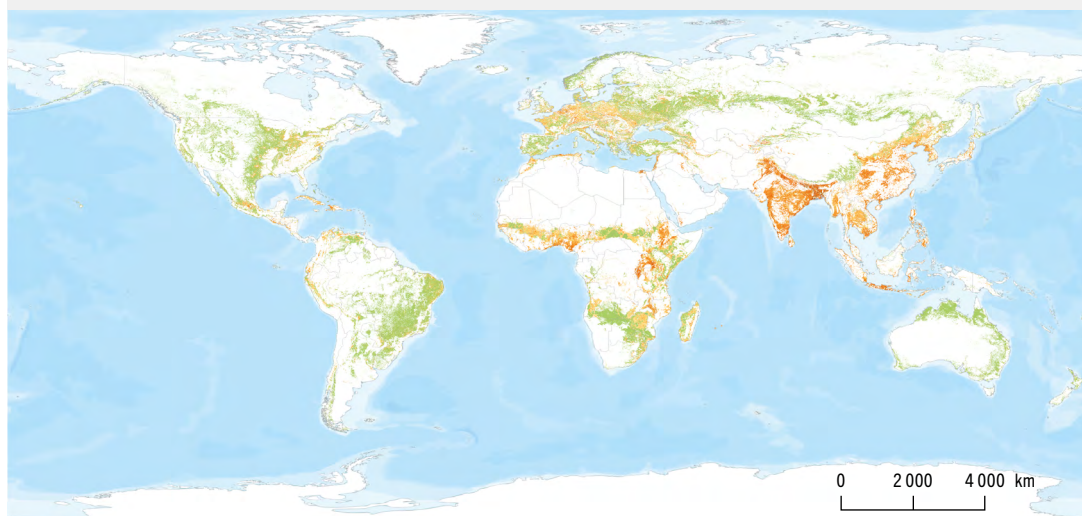
- An estimated 4.17 billion people – 95 percent of all people outside urban areas – live within 5 km of a forest, and 3.27 billion live within 1 km. In many tropical countries, forest-adjacent people earn about one-quarter of their income from forests.
- There is likely a strong relationship between forest proximity and extreme poverty, given that 80 percent of the extreme poor live in rural areas.

Evidence is well established that forests and other tree-based systems support poor people to improve their well-being and mitigate risks, but their role in helping people move permanently out of poverty is less well documented.

- About three-quarters (73 percent) of forests globally were owned publicly in 2015 and 22 percent were owned privately. There has been a slow increasing trend in the proportion of management rights to publicly owned forest held privately, from 2 percent in 1990 to 13 percent in 2015. Local, tribal and indigenous communities are legally recognized as owning at least 447 million ha of forest (as of 2017).

The COVID-19 pandemic had a significant impact on forest value chains and trade in early 2020. Most sectors rebounded quickly, but the risk of future pandemics remains.

- For example, the production of graphic papers such as newsprint dropped by more than 11 percent in 2020 (exacerbating an ongoing trend) but grew for certain other papers, such as those used for packaging. The pandemic may have longer-term impacts on woodfuel, having pushed an estimated 124 million more people into extreme poverty. There is evidence of increased woodfuel use in some countries during the pandemic, and projections suggest that more than 1 billion people in sub-Saharan Africa will still be reliant on polluting fuels such as charcoal and fuelwood by 2025.

FIGURE 3 DENSITY OF PEOPLE LIVING NEAR TREES ON AGRICULTURAL LAND, 2019People per km²

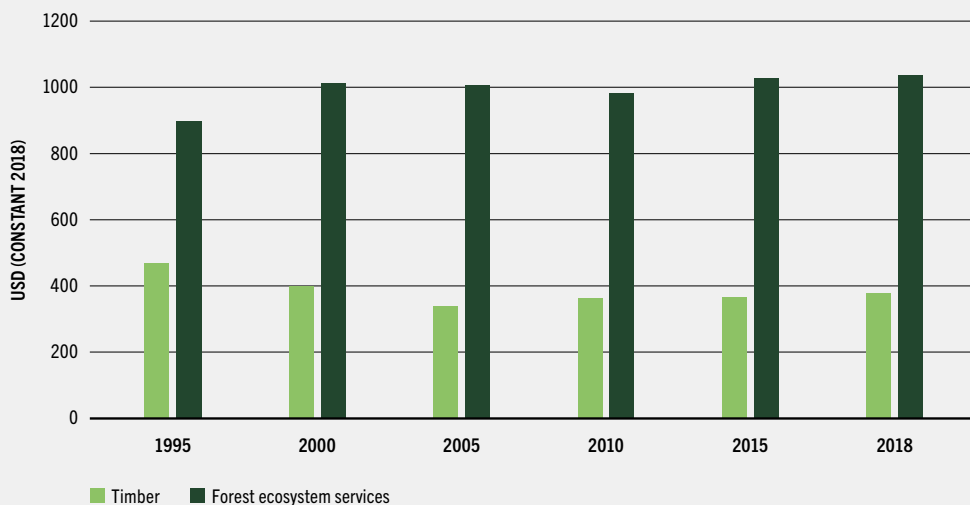
■ ≤ 1
 ■ ≤ 5
 ■ ≤ 50
 ■ ≤ 300
 ■ ≤ 1 000
 ■ ≤ 1 500
 ■ ≤ 1 501
 No trees outside forests

NOTE: The map shows population density in 2019 within 1 km of agricultural land (i.e. croplands or potential grazing land) at least 1 ha in size where at least 10 percent tree cover (excluding forests) is present. Trees outside forests on urban land or non-urban/non-agricultural land are not depicted. The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of FAO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

SOURCES: 100 m resolution global population density data obtained from: WorldPop. Undated. *Open spatial demographic data and research* [online]. [Cited 14 January 2022]. <https://www.worldpop.org/>; 100 m resolution global tree-cover fraction data obtained from Copernicus Global Land Cover: Buchhorn, M., Lesiv, M., Tsendbazar, N.-E., Herold, M., Bertels, L. & Smets, B. 2020. Copernicus Global Land Cover Layers—Collection 2. *Remote Sensing*, 12(6): 1044. <https://doi.org/10.3390/rs12061044>; 500 m resolution agricultural land-cover data obtained from MODIS Land Cover (MCD12Q1.006) to generate spatial overlays that identified population subsets near agricultural lands with trees outside forests in 2019: Friedl, M. & Sulla-Menashe, D. 2019. MCD12Q1 MODIS/Terra+Aqua Land Cover Type Yearly L3 Global 500m SIN Grid V006. NASA EOSDIS Land Processes DAAC. [Cited 19 January 2022]. <https://lpdaac.usgs.gov/products/mcd12q1v006/>. Google Earth Engine was used for the analysis.

► There is a potential longer-term nexus between forests and disease. More than 30 percent of new diseases reported since 1960 are attributed to land-use change, including deforestation, and 15 percent of 250

emerging infectious diseases have been linked to forests. Deforestation, particularly in the tropics, has been associated with an increase in infectious diseases such as dengue fever and malaria.

FIGURE 4 FOREST ECOSYSTEM SERVICES WEALTH PER CAPITA, 1995–2018

NOTE: The forest ecosystem services shown include only recreation, non-timber forest products and water.

SOURCE: Authors' elaboration based on World Bank. 2021. *The Changing Wealth of Nations 2021 – Managing assets for the future*. Washington, DC.

<https://doi.org/10.1596/978-1-4648-1590-4>. License: Creative Commons Attribution CC BY 3.0 IGO

3 – THREE INTERRELATED FOREST PATHWAYS COULD CONTRIBUTE TO GREEN RECOVERY AND A TRANSITION TO SUSTAINABLE ECONOMIES

3.1 Halting deforestation and maintaining forest ecosystem services would benefit climate, biodiversity, health and long-term food security

Halting deforestation is potentially one of the most cost-effective actions for mitigating climate change if efforts ramp up.

- All pathways developed by the Intergovernmental Panel on Climate Change consistent with limiting the mean temperature rise to less than 1.5 °C require that human activities become carbon-neutral by 2050. In addition to rapid decarbonization across economies, significant mitigation will be needed from land-based options. Halting deforestation would both avoid the direct emissions from lost biomass and enable the maintenance of the carbon-absorbing capacity of forests.
- Globally, ecosystems at risk of deforestation or degradation contain at least 260 Gt of irrecoverable

or difficult-to-recover carbon, particularly in peatlands, mangroves, old-growth forests and marshes. Unless additional action is taken, an estimated 289 million ha of forests would be deforested between 2016 and 2050 in the tropics alone, resulting in the emission of 169 GtCO₂e.

- The latest data confirm that agricultural expansion is driving almost 90 percent of global deforestation. This land-use change responds to multiple underlying drivers, including poverty and unsustainable production practices and consumption patterns.
- Recent estimates suggest that halting deforestation could cost-effectively avoid emitting 3.6 +/- 2 GtCO₂e per year between 2020 and 2050, equivalent to 14 percent of the additional mitigation needed by 2030 to keep planetary warming below 1.5 °C, depending on how quickly efforts are ramped up. Taking advantage of REDD+ frameworks could facilitate the implementation and financing of these actions.
- Evidence suggests that halting deforestation would generate multiple other local and global benefits – such as biodiversity conservation, disaster reduction, the protection of soils and water and the maintenance of pollination services – that far exceed the cost of halting deforestation. It would also increase the adaptive capacity and resilience of people and ecosystems.

More efficient, productive and sustainable agrifood systems are key for meeting future needs for food while reducing demand for agricultural land, maintaining forests and securing the multiple benefits that forests provide to farming systems.

- An important source of future competition for land stems from the projected growth in global population to 9.7 billion people by 2050. Taking dietary changes and other factors into account, this could mean an increase in food demand of 35–56 percent by mid-century.
- Certain trade practices involving agricultural and forest products could drive deforestation. Although forest area has expanded in several countries worldwide, the deforestation embodied in some of their imports has increased.
- Sustainably increasing productivity could reduce pressure on forestlands caused by heightened food demand. The effectiveness of this approach may vary, however, depending on the nature of the intensification. Synergies and trade-offs need to be addressed.

The cost of global strategies to prevent pandemics based on reducing the illegal wildlife trade, avoiding land-use change and increasing surveillance is estimated at USD 22 billion–31 billion.

- The cost could be lower (USD 17.7 billion–26.9 billion) if the benefits of reduced deforestation for carbon sequestration are considered. This is a small fraction of the cost caused by a pandemic.

- One Health is an integrated approach recognizing that the health of people is closely connected to the health of animals and the environment. The greater involvement of the forest and wildlife sectors in One Health efforts, and responsible land-use planning, are needed to address some of the underlying drivers of disease emergence.

Multistakeholder engagement is crucial for progress in halting deforestation.

- Various policy responses are addressing the pathway of halting deforestation and maintaining forests. These include decoupling agricultural commodities from deforestation, REDD+, integrated landscape approaches, and strengthening governance and legality.
- Joint public and private initiatives can deliver efficient solutions, and enhanced combinations of landscape approaches with supply-chain governance hold promise as responses to sustainable land-use challenges.

3.2 Forest and landscape restoration and agroforestry help diversify livelihoods and landscapes and increase land productivity

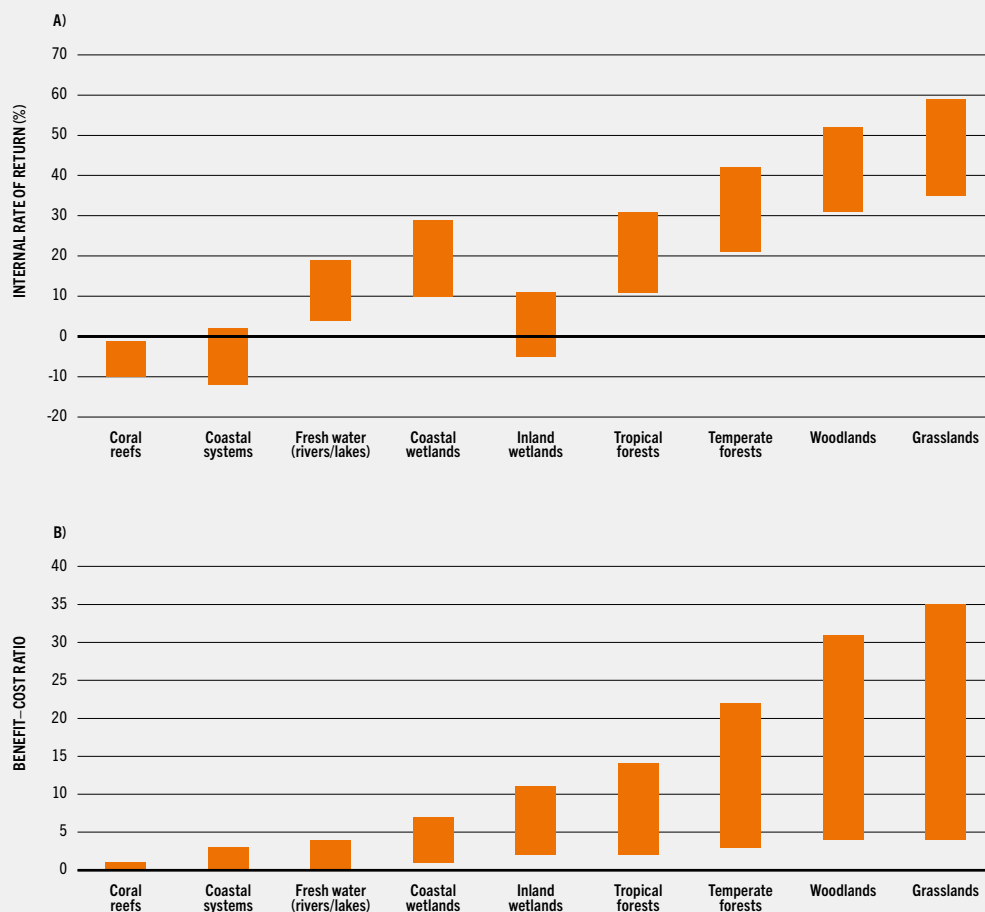
Large areas of degraded land would benefit from restoration involving trees.

- Of the 2.2 billion ha of degraded land identified as potentially (biophysically) available for restoration worldwide, 1.5 billion ha may be best suited for mosaic restoration combining forests and trees with agriculture.

A further 1 billion ha of croplands on previous forestlands affected by land-use change would benefit from strategic additions of trees to increase agricultural productivity and the provision of ecosystem services.

Restoration involving trees can provide large environmental and economic benefits.

- According to one estimate, the restoration of 350 million ha of deforested and degraded land by 2030 could deliver a net benefit of USD 0.7–9 trillion and USD 7–30 for every USD 1 invested. Another study estimated that the restoration of degraded land through afforestation and reforestation could cost-effectively take 0.9–1.5 GtCO₂e per year out of the atmosphere between 2020 and 2050.
- An assessment in 42 African countries showed that the benefit of land restoration and conservation for agricultural productivity is 3–26 times greater than the cost of inaction. The restoration of 4 million ha of degraded land in the Sahara and the Sahel created more than 335 000 jobs.
- Restoring degraded ecosystems can enhance the provision of ecosystem services. For example, one meta-analysis found that restoration increased the provision of biodiversity and ecosystem services by an average of 44 percent and 25 percent, respectively, relative to levels in degraded systems.
- Greenhouse-gas emissions from peatlands after they are drained or when they burn are estimated to constitute about 5 percent of the »

FIGURE 10 INTERNAL RATES OF RETURN (A) AND BENEFIT–COST RATIO (B) FOR RESTORATION IN NINE MAJOR BIOMES

NOTE: Based on 316 case studies over 20 years with a management cost component of up to 5 percent of the capital cost.

SOURCE: De Groot, R.S., Blynnaut, J., Van Der Ploeg, S., Aronson, J., Elmqvist, T. & Farley, J. 2013. Benefits of investing in ecosystem restoration. *Conservation Biology*, 27(6): 1286–1293. <https://doi.org/10.1111/cobi.12158>

- » global CO₂ emissions caused by human activities. The economic benefit of peatland restoration is likely to be considerably higher than the cost.
- Fire contributes more than 5 percent of greenhouse-gas emissions from agriculture, forestry and other land use. Integrated fire prevention and suppression as part of landscape management measures are several orders of magnitude less costly than fire-fighting and post-fire restoration.
- Agroforestry systems tend to be more resilient than conventional agriculture to environmental shocks and the effects of climate change. Depending on the system and local conditions, agroforestry can achieve 50–80 percent of the biodiversity of natural forests; increase food security and nutrition by serving as a safety net; and increase crop productivity.

The scaling up of restoration and agroforestry is hindered by the longer time required to obtain profitable returns.

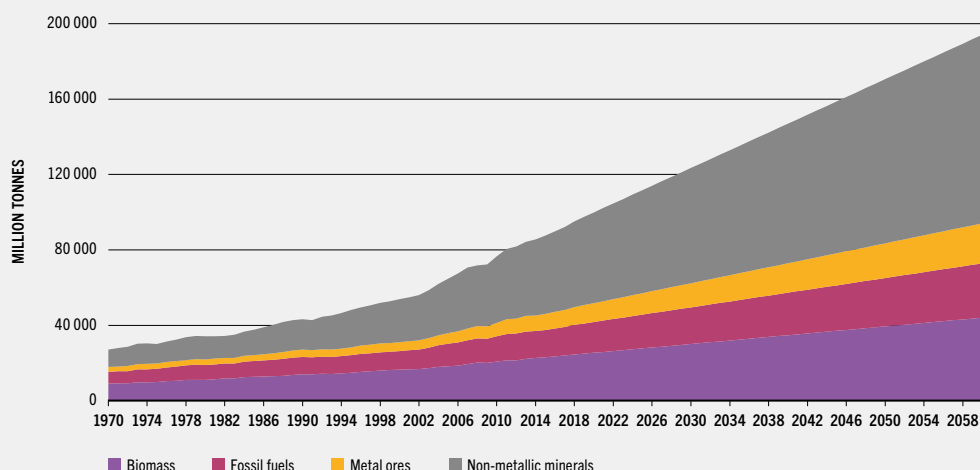
- There is evidence that well-planned and -executed investments in restoration will have net economic benefits. One analysis showed that, even in a worst-case scenario, investing in restoration would return a financial profit in six of nine ecosystem types assessed. Nevertheless, more data are needed to fully assess the costs and benefits of restoration policies and action.
- Although numerous studies have demonstrated the higher productivity of agroforestry systems, many farmers perceive them as less productive and

thus financially risky. On average, agroforestry sees profitable returns after 3–8 years; for annual cropping systems, this period is normally 1–2 years. The greater uptake of agroforestry requires incentives and strategic investments to achieve restoration and improved production objectives.

3.3 Increasing sustainable forest use, and building green value chains, would help meet future demand for materials and support sustainable economies

The world will need more renewable materials.

- The annual global consumption of all natural resources combined is expected to more than double from 92 billion tonnes in 2017 to 190 billion tonnes in 2060 due to increases in population size and affluence. Twenty-five percent of total material demand today is met by biomass and the remainder by non-renewable resources. Annual biomass extraction increased from 9 billion tonnes in 1970 to 24 billion tonnes in 2017 and is expected to reach 44 billion tonnes by 2060.
- World production of roundwood (at 3.91 billion m³ in 2020) has increased by 12 percent in the last two decades. Demand for forest-based biomass is expected to rise further, driven mainly by construction (with demand in that sector expected to almost triple by 2030) and packaging (with demand expected to double by 2030).

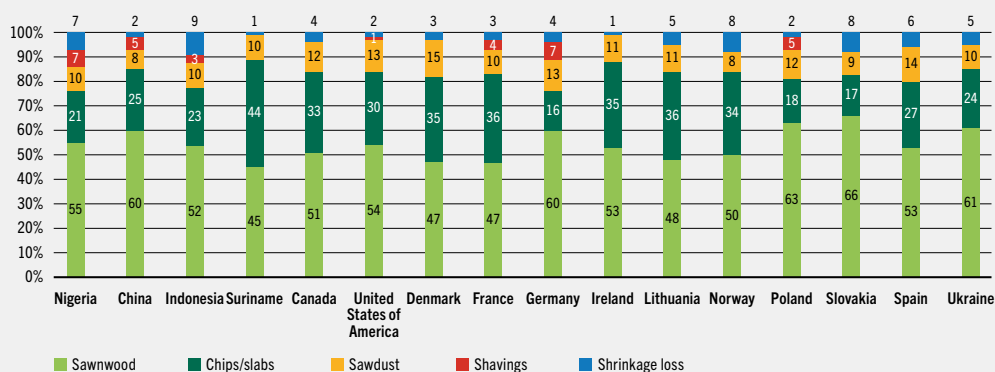
FIGURE 11 PROJECTED GLOBAL MATERIAL EXTRACTION, 2015–2060, ASSUMING A CONTINUATION OF CURRENT TRENDS

SOURCE: Oberle, B., Bringezu, S., Hatfield-Dodds, S., Hellweg, S., Schandl, H. & Clement, J. 2019. *Global resources outlook 2019 – Natural resources for the future we want*. Nairobi, United Nations Environment Programme.

An increase in forest area and sustainable forest management can support a green recovery and a transition to carbon-neutral economies.

- Wood products are associated with lower greenhouse-gas emissions over their entire life cycles compared with products made from non-renewable or emissions-intensive materials. A review of the literature suggests that for every 1 kg of carbon in wood products used in construction to substitute non-wood products, there is an average emission reduction of approximately 0.9 kg of carbon.

- There would be other benefits, too, such as the creation of green jobs – it has been estimated, for example, that wood production and primary processing to meet expected demand for housing in Africa by 2050 would contribute up to USD 83 billion to economies and create 25 million jobs. But unlocking this potential requires investment to develop sufficient capacity.
- Sustainably meeting rising demand will entail an increase in supply through restoration, reforestation and afforestation on

FIGURE 12 MATERIAL BALANCE IN THE SAWMILLING PROCESS FOR NON-CONIFEROUS SAWNWOOD

SOURCE: FAO, International Tropical Timber Organization & United Nations. 2020. *Forest product conversion factors*. Rome.
<https://doi.org/10.4060/ca7952en>

degraded lands. It will also require increasing the lifespan of wood products, reducing waste through more efficient processing and the cascading use of forest products, changing consumption patterns, and facilitating a transition to more circular economies. Achieving the maximum technical recycling potential of waste wood and paper would increase the wood-use efficiency ratio in the European wood sector by 31 percent, leading to a concomitant reduction in greenhouse-gas emissions of 52 percent.

- Forest-based bioenergy needs to become more efficient, cleaner and

greener – for example, an estimated one-third of woodfuel extraction in the tropics is unsustainable. The gap between demand and sustainable supply can be bridged by the restoration of degraded forests, a move away from the inefficient use of woodfuel for cooking, the environmentally appropriate establishment of tree plantations, improving the use of residues from wood harvesting and processing, and the recovery of post-consumer wood through its cascading use within a more circular economy.

There is potential to mobilize forest-based industries to scale up innovative green value chains.

- The non-food biobased industries are estimated to grow by 3.3 percent per year to 2030, with the projected output valued at USD 5 trillion. A diverse range of emerging forest-based bioproducts has the potential to tap into this growth, including biochemicals, bioplastics and textiles. There are potential environmental benefits: for example, every 1 kg of carbon of manufactured cellulosic (wood-based) textiles replacing a non-wood textile could avoid carbon emissions of up to 2.8 kg of carbon.

4 – VIABLE OPTIONS EXIST FOR SCALING UP INVESTMENT IN THE FOREST PATHWAYS – WITH POTENTIALLY CONSIDERABLE BENEFITS

Forest investment is well below what is required.

- According to one estimate, total financing for the forest pathways needs to increase threefold by 2030 and fourfold by 2050 for the world to meet climate, biodiversity and land degradation neutrality targets, with the estimated required finance for forest establishment and management alone amounting to USD 203 billion per year by 2050.
- Private-sector finance is an important source of funding for forestry, especially the restoration and

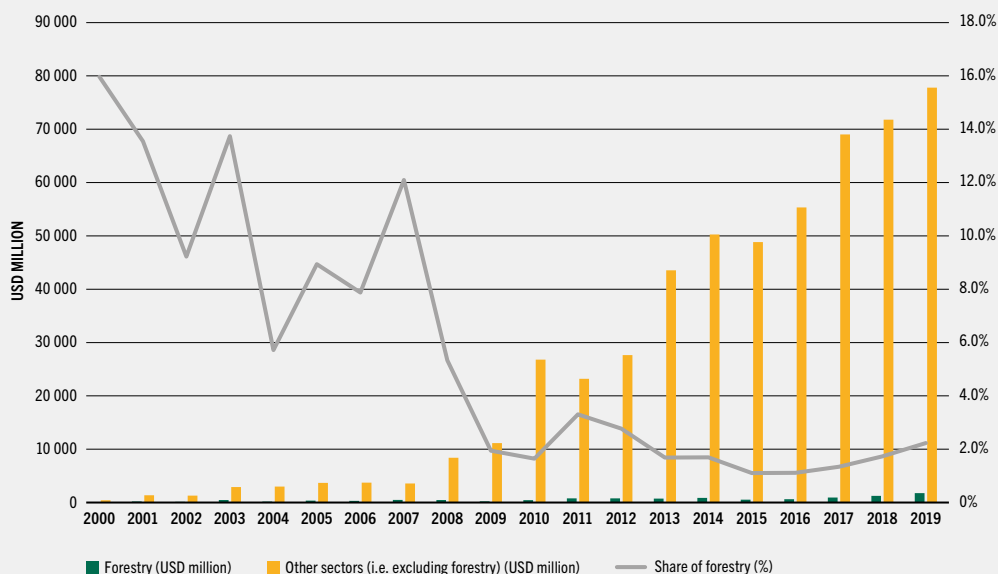
sustainable-use pathways, but is hard to quantify – it is estimated to account for about 14 percent of current total funding flows for nature-based solutions, including forestry.

- One (2017) estimate suggests that the private sector invests USD 1.5 billion–2 billion per year in plantations and USD 6.5 billion in wood processing in Africa, Asia and Latin America. Investments in value-adding processing facilities can be considered investments in green value chains if the raw materials are sourced sustainably.
- Few COVID-19 pandemic recovery plans have strong components for mobilizing finance for the forest pathways. As of May 2021, green measures accounted for just 2.6 percent of total fiscal spending (i.e. USD 420 billion of USD 16 trillion) related to the pandemic in the world's 87 largest economies. Most recovery programmes still need to be improved to increase their positive impacts on green sectors, including forestry.

All sources of funding – domestic government, private, and official development assistance – will need to be tapped, and new approaches are emerging.

- There are at least five high-potential areas for scaling up implementation of the forest pathways – (1) greening public domestic finance; (2) making climate finance work for forest-based approaches; (3) greening financial markets with regulatory and supervisory tools, with the clear positioning of forest-based

FIGURE 15 CLIMATE FINANCE FOR FORESTRY



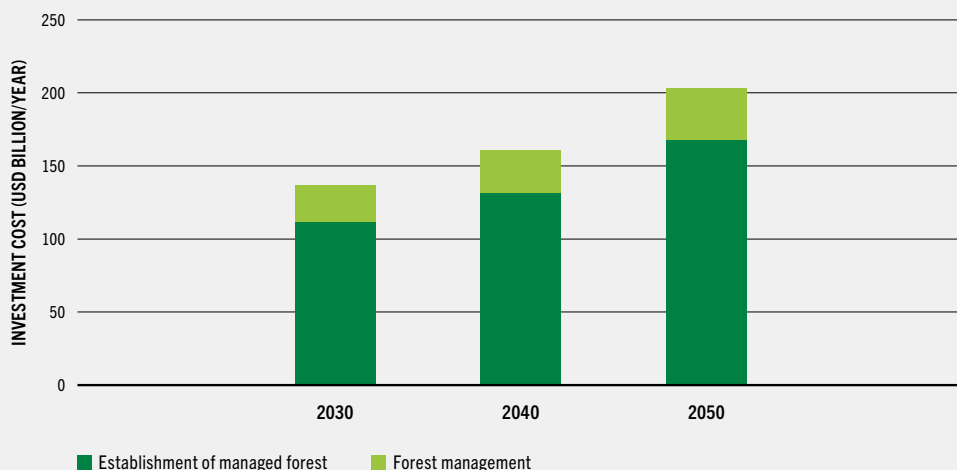
SOURCE: Organisation for Economic Co-operation and Development DAC Climate-related Development Finance database, compiled by FAO.

approaches; (4) developing pipelines of investment-grade projects; and (5) supporting investment in value-added wood processing in countries of origin.

- Domestic public expenditure on forestry far exceeds official development assistance and (tracked) private finance flows, even in some low-income countries. In 13 sub-Saharan African countries, national governments spend 3.5 times more on forestry than the amount received for this

purpose as official development assistance. Ecological fiscal transfers, implemented in only a few countries to date, amount to 20 times the global official development assistance for forestry.

- Investment in forest conservation and restoration appears to be ramping up, including by companies. Many investment instruments with high feasibility in emerging markets are relevant to the forest sector. Blended finance models could help de-risk private-sector investments

FIGURE 19 ADDITIONAL INVESTMENT REQUIRED IN FOREST PATHWAYS UNDER AN “IMMEDIATE ACTION” SCENARIO

SOURCE: United Nations Environment Programme. 2021. *State of finance for nature – Tripling investments in nature-based solutions by 2030*. Nairobi.

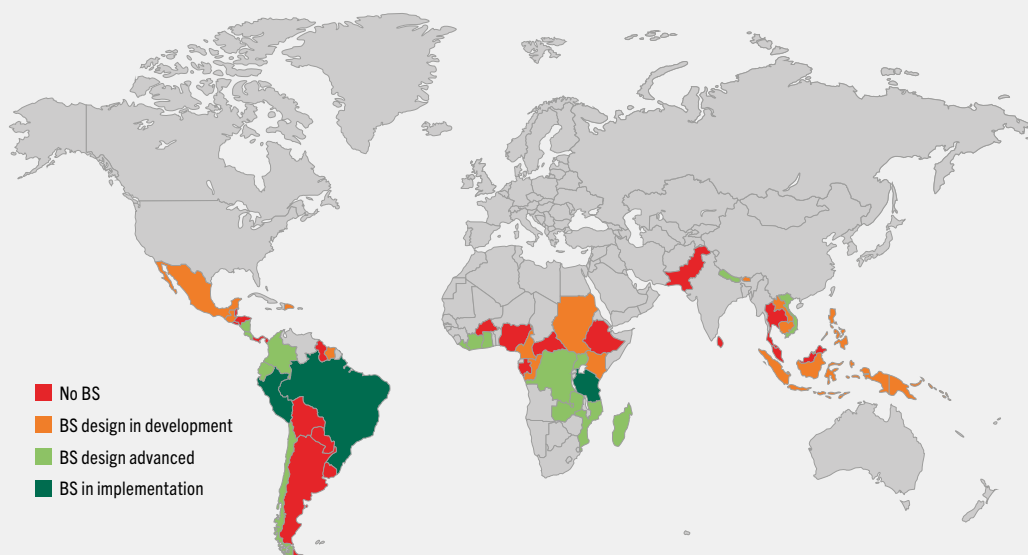
that have significant public value but insufficiently attractive risk–return profiles. Green bonds are developing but, to date, only 3 percent are oriented towards nature-based approaches.

- ▶ Many countries recognize the mitigation potential of forests in their recent nationally determined contributions. Many also recognize the role of trees in climate-change adaptation, and there is further potential for countries to integrate forests and trees into their national adaptation plans. A significant number of country targets are conditional

on international climate finance, however, highlighting the need for continued support for forest countries.

- ▶ Carbon markets are expected to continue growing, driven by carbon-neutrality pledges and recent decisions under the Paris Agreement on climate change. Results-based payments for REDD+ are evolving to deliver climate-change mitigation results with environmental integrity and adequate benefit-sharing; such payments, and the potential sale of carbon offsets, could improve the financial attractiveness of the three forest pathways.

FIGURE 23 STAGE OF DEVELOPMENT OF BENEFIT-SHARING MECHANISMS UNDER REDD+ IN THE 54 COUNTRIES SUPPORTED BY UN-REDD, THE FOREST CARBON PARTNERSHIP FACILITY AND OTHER INITIATIVES



NOTE: BS = benefit-sharing.

SOURCE: Bertzky, M., Canosa, O., Koch, A. & Llopis, P. 2021. *Assessment report – Comparative analysis of benefit-sharing mechanisms in REDD+ programs*. World Wide Fund for Nature. (also available at https://wwfint.awsassets.panda.org/downloads/wwf_assessment_report_redd_programs_v4.pdf).

Markets for carbon-neutral and sustainable products require credible monitoring, reporting and verification systems – and these are improving. Climate finance can be used to mobilize additional private-sector capital, reinforce domestic policy instruments and support result-based payments.

- Recent developments in financing could support the forest pathways,

with national forest financing strategies helping to direct public investment. For example, about 40 new conservation trust funds have been established since 2010, joining 68 previously formed such funds. Many national climate funds offer windows that can support the forest sector.

Redirecting socially and environmentally harmful support, and improving the regulatory environment, could release considerable funding for the forest pathways.

- Scaling up investment will require the strategic use of policy instruments to reorient incentives and boost green markets and financing. For example, repurposing agricultural subsidies – currently almost USD 540 billion per year – to include agroforestry and forestry could help avoid the harmful impacts embodied in 86 percent of such subsidies.
- Countries are adopting standards, regulations and due-diligence requirements to divert financial flows away from actions that harm forests. This trend will likely expand both geographically and in the range of commodities covered.

Getting finance to small-scale producers will be essential for implementing the pathways.

- Less than 2 percent of global climate finance is reaching small farmers, Indigenous Peoples and local communities in developing countries. Nevertheless, new approaches are helping mobilize investment for smallholders, including to reduce perceived risks for investors. Benefit-sharing mechanisms for REDD+ are evolving, but full implementation is limited despite broad interest and readiness efforts in many developing countries.
- More support is needed to develop pipelines of investment-grade projects and programmes to tap into

emerging financing opportunities. Options include investment facilities that help small and medium-sized enterprises and others operating in forest value chains to aggregate production, add value and prepare quality projects; and developing and deploying tools that can help inform investment decisions.

5 – SMALLHOLDERS, LOCAL COMMUNITIES AND INDIGENOUS PEOPLES ARE CRUCIAL FOR SCALING UP IMPLEMENTATION OF THE FOREST PATHWAYS

The involvement of smallholders, local communities and Indigenous Peoples in the forest pathways is essential.

- Family farmers account for 80 percent of world food production, and those holding less than 2 ha of land account for 35 percent. In many countries, up to 90 percent of forest enterprises are small or medium-sized; such enterprises generate more than half of forest-related employment.
- Smallholders, local communities and Indigenous Peoples own or manage at least 4.35 billion ha of forest and farmlands; according to one study, smallholders produce farm and forest products worth up to USD 869 billion to USD 1.29 trillion per year.

Local actors can be highly effective – and cost-effective – forest managers.

- There is evidence that, in general, smallholders with secure tenure

tend to make longer-term investments in their lands and forests, compared with those with no or short-term security.

- Studies show that 91 percent of all indigenous and community lands are in good or moderate ecological condition, pointing to their potential for cost-effectively reducing deforestation and improving forests. For example, securing indigenous lands in some countries in Latin America would cost less than 1 percent of potential revenues from carbon storage alone.

Customary forest rights are increasingly recognized in statutory laws, although progress has not been uniform.

- The devolution of rights on public lands in many countries has increased the ability of smallholders, local communities and Indigenous Peoples to sustainably harvest high-value forest resources and derive income from ecosystem services, REDD+ and carbon credits. There was a global slowdown in tenure recognition for Indigenous Peoples, local communities and rural women between 2002 and 2017, however.
- Accelerating the formalization of customary and collective rights is crucial for protecting remaining forests and mobilizing resources for recovery. Some governments are pursuing policies to, for example, recognize customary lands without the need for titling and simplify land registration processes. A range of new

low-cost technologies can also help secure community tenure through participatory processes.

- For most smallholders, tree (and carbon) rights are even more uncertain than land rights. Although this is changing, most countries that give farmers tree rights also heavily regulate tree use and management on private lands. Governments can promote restoration and agroforestry by, for example, offering secure, long-term rights to trees and tree products in exchange for the adoption of good management practices, such as sustainable agroforestry.

Local producer organizations and other relevant groups can help enable the three forest pathways but require support.

- More than 8.5 million social cooperation groups exist worldwide, and their influence in forestry is growing. The three types are: (1) groups such as community forest user groups formed to protect user rights, enable and promote sustainable production and value-adding, and provide business and financial services to members; (2) groups associated with social movements, such as to advance legal reforms to strengthen rights and remove regulatory barriers; and (3) groups aimed at inclusively addressing deforestation and forest degradation as part of jurisdictional approaches.
- Existing financial programmes and policies to support such organizations

provide insights into how this might be done elsewhere.

Increasing capacity and co-producing knowledge with smallholders, local communities and Indigenous Peoples would help scale up the three forest pathways.

- ▶ Capacity development in forestry has declined in many countries, but opportunities exist to reverse this trend. A starting point would be to reinvest in forestry and agroforestry extension programmes, such as through farmer and pastoralist field schools and learning-by-doing initiatives in community-based forestry. Identifying and capitalizing on diverse sources of knowledge and new technologies can facilitate innovative and inclusive solutions grounded in local systems.
- ▶ Supportive policies could be put in place to enable forestry capacity development based on partnerships and engagement between traditional knowledge-holders and service, training and educational organizations. A range of actions is available to ensure that efforts are inclusive of women and men, youth, Indigenous Peoples, the poor and the vulnerable.
- ▶ Mobilizing and investing in digital technologies and services can help accelerate change and the uptake of the three forest pathways. Increasing means exist for overcoming barriers to digital engagement, but there are significant limitations: about one-quarter of people in least-developed countries

lack access to mobile broadband services and, in Africa, only about 6 percent of rural households have internet access. Nevertheless, information from public and private technical and extension services is increasingly available online and as apps on mobile devices, making them more inclusive. Increasing internet access in rural areas could enable the rapid strengthening of local organizations and their work in supporting local green recovery and sustainable development.

6 – THE FOREST PATHWAYS – A MEANS FOR GREEN RECOVERY AND RESILIENT ECONOMIES?

Most countries have taken steps along the forest pathways, although few appear to have coherent policies to promote all three and enhance their complementarity.

- ▶ There is clear international momentum for the pathways, and the time is right for bold strategies to scale up the pathways in ways that are mutually reinforcing and build resilience.

The three forest pathways carry economic, social, political and environmental risks.

- ▶ For example, there is a risk that investors, including smallholders, will miss investing in more profitable ventures; conversely, the diversification offered by the forest pathways could increase the economic resilience of local actors. Another risk

is that climate change could threaten the viability of restoration efforts, and adaptive management will be important to mitigate this.

Next steps could involve four possible actions:

1. directing funding for recovery towards long-term policies aimed at creating sustainable economies and green jobs and further mobilizing private-sector investment;
2. empowering and incentivizing local actors to take a leading role in the forest pathways;
3. engaging in policy dialogue on sustainable forest use as a means for simultaneously achieving economic and environmental goals; and
4. maximizing synergies among the three forest pathways and between agricultural, forestry, environmental and other policies and minimizing trade-offs. ■



2022

THE STATE OF THE WORLD'S FORESTS

FOREST PATHWAYS FOR GREEN RECOVERY AND BUILDING INCLUSIVE, RESILIENT AND SUSTAINABLE ECONOMIES

Against the backdrop of the Glasgow Leaders' Declaration on Forests and Land Use and the pledge of 140 countries to eliminate forest loss by 2030 and to support restoration and sustainable forestry, the 2022 edition of *The State of the World's Forests* explores the potential of three forest pathways for achieving green recovery and tackling multidimensional planetary crises, including climate change and biodiversity loss.

The three interrelated pathways are halting deforestation and maintaining forests; restoring degraded lands and expanding agroforestry; and sustainably using forests and building green value chains. The balanced, simultaneous pursuit of these pathways can generate sustainable economic and social benefits for countries and their rural communities, help sustainably meet increasing global demand for materials, and address environmental challenges.

The State of the World's Forests 2022 presents evidence on the feasibility and value of the pathways and outlines initial steps that could be taken to further pursue them. There is no time to lose – action is needed now to keep the global temperature increase below 1.5 °C, reduce the risk of future pandemics, ensure food security and nutrition for all, eliminate poverty, conserve the planet's biodiversity, and offer young people hope of a better world and a better future for all.



*The State of the World's
Forests 2022 (full text)*



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