RESTORING FORESTS AND LANDSCAPES: THE KEY TO A SUSTAINABLE FUTURE

THE GLOBAL PARTNERSHIP ON FOREST AND LANDSCAPE RESTORATION

Recommended citation
Besseau, P., Graham, S. and Christophersen, T. (eds.), 2018. Restoring forests and landscapes: the key to a sustainable future. Global Partnership on Forest and Landscape Restoration, Vienna, Austria.

ISBN No: 978-3-902762-97-9

Published by
International Union of Forest Research Organizations (IUFRO) on behalf of the Global Partnership on Forest and Landscape Restoration (GPFLR)

Disclaimer
The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the publishers concerning the legal status of any country, territory, city area or its authorities, or concerning delimitation of its frontiers or boundaries. Moreover, the views expressed do not necessarily represent the decision or the stated policy of the publishers, nor does citing of trade names or commercial processes constitute endorsement.

Reproduction
This publication may be reproduced in whole or in part and in any form for educational or non-profit purposes without special permission from the copyright holder, provided acknowledgement to the source is made. The Global Partnership on Forest and Landscape Restoration would appreciate receiving a copy of any publication that uses this publication as a source.

No use of this publication may be made for resale or any other commercial purpose whatsoever without prior permission in writing from the Global Partnership on Forest and Landscape Restoration.

Acknowledgements
The editors would like to thank all members of the Global Partnership on Forest and Landscape Restoration for their contributions and reviews, and the UN Environment Programme for funding the production of this report.

Design
Communication Division, UN Environment

Available from

IUFRO Headquarters
Marxergasse 2, 1030 Vienna, Austria
Tel +43 1 877 0151 0
Email: office@iufro.org
www.iufro.org

United Nations Environment Programme
P O Box 30552, Nairobi, 00100, Kenya
Tel +254 20 7621234
Email: unenvironment-publications@un.org
www.unenvironment.org

GLOBAL PARTNERSHIP ON FOREST AND LANDSCAPE RESTORATION

RESTORING FORESTS AND LANDSCAPES: THE KEY TO A SUSTAINABLE FUTURE

THE GLOBAL PARTNERSHIP ON FOREST AND LANDSCAPE RESTORATION

© Ulet Ifansasti/CIFOR

CONTENTS

I. INTRODUCTION 6

II. THE RESTORATION OPPORTUNITY

The damage from degradation 9
Restoration as a solution 12
The benefits of restoration 13

III. THE EMERGENCE OF RESTORATION

National and global goals 16
Partnership and principles 20

IV. RESTORATION IN ACTION

Success stories 23
Regional initiatives 24

V. FINANCING RESTORATION

Investment opportunities 28
Unlocking capital 28

VI. MAKING RESTORATION GLOBAL

Leadership, visibility and reach 31
Strengthening the framework 31
Scaling up investment 32
Deepening commitments 33

ANNEX | CASE STUDIES

Keeping cattle from the riverbank pays in Brazil 36
The "crazy" rewards of fenced plots in Burkina Faso 38
Communities in Nepal taking landscapes into their own hands 40
Model restoration in the red soils of southern China 42
Regenerating an American forest for jobs, wildlife and fire protection 44

© CC BY CIFOR

I. INTRODUCTION

"Nothing is as powerful as an idea whose time has come." (Victor Hugo)

Forest and landscape restoration[1] is an idea whose time has most definitely come. The negative consequences of human actions have brought our world and our future to a dangerous crossroads: will we be able to avert the worst impacts of climate change? How can we stop and reverse the loss of fertile soil, biodiversity, and other natural capital that supplies all our food and other basic needs? Where are the jobs for millions of unemployed young

1 Also known as forest landscape restoration. For a definition see page 18 of this report.

people? How can we reduce the number of migrants driven from their homes by drought, land degradation, food insecurity or conflict over natural resources?

Healthy and productive landscapes and the vital benefits they provide are key to these pressing challenges. Agriculture currently provides nearly one in every three jobs worldwide[2]. Yet we are losing ecosystems services including food production worth more than $6 trillion a year[3] to erosion and other forms of degradation, putting yet more forested land under pressure for conversion to agriculture. Ongoing environmental degradation in rural areas could unravel the social and economic fabric across many areas of our planet. We cannot afford this.

Forest and landscape restoration is the process of reversing the degradation of soils, agricultural areas, forests, and watersheds thereby regaining their ecological functionality. Restoration can happen by taking deliberate steps to integrate a greater number and variety of tree species into gardens, farms, fields and forests; or by allowing natural regeneration of overgrazed, polluted or otherwise overused ecosystems. Essentially, it is a process to improve the productivity and capacity of landscapes to meet the various and changing needs of society.

Encouragingly, momentum for restoration is building. Though forest loss continues, trees are increasing in number and variety across many landscapes, bringing diversity and value to the world's farms, in and around cities, and across highly varied landscapes that have seen forests and trees disappear in previous decades. And we now have political commitments from dozens of countries to bring over 160 million hectares of degraded land under restoration as part of the Bonn Challenge (see Section III). That is a good start toward attaining the global goals of bringing 150 million hectares into restoration by 2020 and 350 million hectares by 2030 – an area almost the size of India.

Achieving these goals requires the broadest possible support. The members of the Global Partnership on Forest and Landscape Restoration[4] are willing and able to support governments, the private sector, local communities and

2 International Labour Organization/World Bank, Employment in Agriculture. World Bank DataBank.

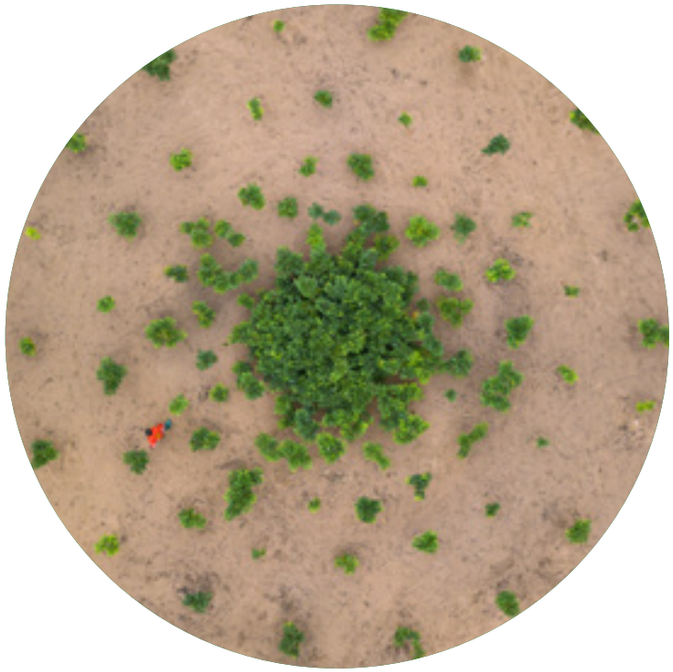
3 Sutton, P.C., Anderson, S., Costanza, R. and Kubiszewski, I., 2016. The Ecological Economics of Land Degradation: Impacts on Ecosystem Service Values. Ecological Economics 129: 182–192.

4 See the Global Partnership's website www.forestlandscaperestoration.org for more details.

others in their restoration efforts. We need to use this momentum to draw together political support, financial muscle and the entrepreneurship of the private sector and massively scale up restoration from promising pilot initiatives to an area of many millions of hectares. Specifically, we need more climate finance and private capital to flow into restoration projects to complement domestic budget allocations. And we need to exchange knowledge and experience to improve forest and landscape restoration interventions as we move forward.

This publication provides facts, figures and key messages to encourage more investments in forest and landscape restoration, leading to more restoration action. The Global Partnership on Forest and Landscape Restoration outlines how we can reach the 2020 and 2030 targets, and how we can best collaborate, using regional and global platforms. If we work together in the decade ahead, we will be able to proudly say in 2030 that forest and landscape restoration was an essential contribution to achieving some of the most important goals we have set for ourselves and our planet: for climate, biodiversity, poverty alleviation and others, and for the future we want.

Khasi community in Meghalaya, India
© WeForest



© CC BY CIFOR

II. THE RESTORATION OPPORTUNITY

THE DAMAGE FROM DEGRADATION

Restoration is an urgent response to the poor management of land, that most fundamental of resources. While land degradation and deforestation date back millennia, industrialization, rising population and runaway consumption have dramatically accelerated the process. Today, degradation is already impacting the well-being of at least 3.2 billion people, fuelling fears of a mass species extinction and costing more than 10 per cent of the

annual global gross product in lost ecosystem services[5]. Climate change threatens to magnify that harm.

Almost 40 per cent of all land is used for farming. We are losing the fertility of our soils to erosion, depletion and pollution. About 20 per cent of the Earth's vegetated surface shows declining trends in productivity[6]. By 2050, degradation and climate change could reduce crop yields by 10 per cent globally and by up to 50 per cent in certain regions[7].

A significant factor in this degradation is the removal of vast numbers of trees from rural landscapes. The remaining forests are also threatened. While deforestation has slowed in recent decades, forests and the services they provide continue to shrink. Some 129 million hectares – an area almost the size of South Africa – have been lost since 1990[8].

Pastoralist in Senegal.
© TerrAfrica Partnership & Andrea Borgarello

5 Intergovernmental Science-Policy Platform on Biodiversity and Ecosystems Services, 2018. Summary for policymakers of the thematic assessment report on land degradation and restoration.

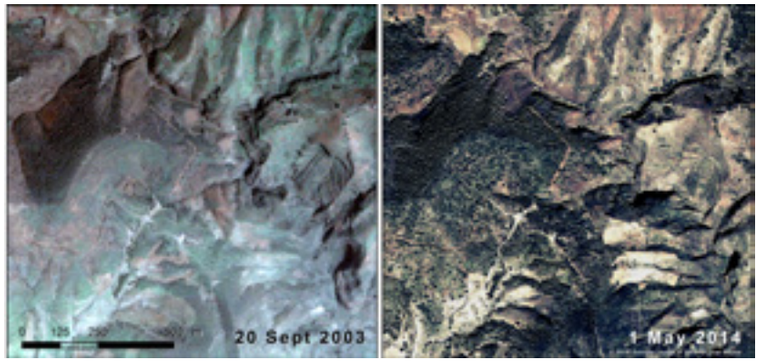
6 United Nations Convention to Combat Desertification, 2017. The Global Land Outlook.

7 Intergovernmental Science-Policy Platform on Biodiversity and Ecosystems Services, 2018. Summary for policymakers of the thematic assessment report on land degradation and restoration.

8 Food and Agriculture Organization of the United Nations, 2016. Global Forest Resources Assessment 2015. How are the world's forests changing?

FIGURE 1 FOREST AND LANDSCAPE RESTORATION IN NUMBERS:

Sources as elsewhere with additionally: Wolosin, M., 2014. Quantifying Benefits of the New York Declaration on Forests. Data correct as of May 2018. Carbon sequestration estimate developed by FAO for this report, based on a range of ongoing forest and landscape restoration projects.



Satellite image pair showing afforestation on humid highland in Santo Antão. © CILSS[9]

RESTORATION AS A SOLUTION

The threat posed by degradation can seem daunting. Vast areas are affected. The causes are complex and tough to address. However, our growing understanding of how natural systems work, and of their importance to human well-being and security present huge opportunities for positive change.

Through the Sustainable Development Goals and other agreements, the international community is committed to putting the ways that we use and manage Earth's natural capital onto a more sustainable track. Forest and landscape restoration has emerged as a key element in strategies to meet this challenge, encompassing our efforts to address land management, biodiversity conservation and climate change.

An assessment by the Global Partnership on Forest and Landscape Restoration identified approximately 2 billion hectares of the world's deforested and degraded forest lands where opportunities for restoration may be found – an area larger than South America[10]. (See Figure 1 for more statistics on restoration).

Most deforested and degraded land offers opportunities for "mosaic restoration" – where forests and trees are combined with agriculture, waterways,

9 CILSS (2016). Landscapes of West Africa – A Window on a Changing World. U.S. Geological Survey EROS

10 World Resources Institute, 2011. A World of Opportunity.

protected areas and settlements on a landscape scale. Other areas may be more suited to "wide-scale restoration" of closed forests. Croplands and densely populated areas can also benefit greatly from having more trees. The Global Partnership has developed an integrated, flexible and effective approach to forest and landscape restoration. Its interventions are already bringing gains for both livelihoods and the environment in many different contexts around the world, from coastal mangroves and mountain ranges to freshwater wetlands and intensively cultivated agrarian zones. This approach can be applied at scales from the individual farm to a whole region. And it offers a gateway for everyone, from national governments and investors to civil society groups and individuals, to engage and benefit.

THE BENEFITS OF RESTORATION

In agricultural lands, adding trees brings benefits including enhanced productivity and soil fertility, erosion control, shade and fodder – an approach often described as agroforestry. In forests, restoration can mean improving the availability of forest products from timber to game animals, stabilizing drinking water supplies for burgeoning cities, and countering biodiversity loss.

For instance, in the Sahel region of Africa, a key element driving restoration is a realization by farmers that planting and protecting more trees on their

California fire crewman sprays down a hotspot at the Rim Fire. © CC BY U.S. Department of Agriculture

land improves their soils and crops. In Myanmar, communities given the right to access and exploit forest resources are motivated to improve – not deplete – them. In Latin America, municipalities are helping fund the restoration of upland pastures to secure clean water supplies for urban consumers. And in the United States, authorities are restoring forests to counter dangerous wildfires and make landscapes more hospitable to endangered species and more resilient in the face of change.

Investing in restoration brings many economic benefits, both direct and indirect. For example, restoration creates jobs on the land and in tree nurseries; farms and timber industries can enjoy higher and more sustainable yields; and the costs of repairing flood damage to infrastructure, dredging lakes and rivers to remove silt, and of filtering drinking water are avoided. By one estimate, restoring 350 million hectares of degraded and deforested lands around the world would create up to $9 trillion in net benefits[11]. Many would accrue to poor rural communities, helping alleviate poverty. The wider benefits include social and environmental gains in water and food security, biodiversity conservation and climate protection that help us all. Restoration and other natural solutions could, for instance, offer more than one third of the solution to the climate crisis. Investments in natural climate solutions are also safer, less costly and more beneficial to society than many technological alternatives that are currently being discussed[12].

Forest and landscape restoration is also about engaging with and empowering stakeholders. It gives everyone a say in how to make the best use of land amid competing and growing demand. Doing so on a landscape scale builds social capital and makes it easier to reach the compromises necessary to secure long-term support and provides the greatest overall benefits.

Forest and landscape restoration has come of age. Its costs are known and measurable and are clearly outweighed by the benefits[13]. It is an approach that has proved itself and is ripe for much wider application. It is an opportunity that we cannot afford to pass up.

11 Verdone, M. and Seidl, A., 2017. Time, space, place, and the Bonn Challenge global forest restoration target. Restoration Ecology, 25: 903-911.

12 Griscom, B.W., et al, 2017. Natural climate solutions. Proceedings of the National Academy of Sciences. Oct 2017, 201710465.

13 Intergovernmental Science-Policy Platform on Biodiversity and Ecosystems Services, 2018. Summary for policymakers of the thematic assessment report on land degradation and restoration.

© CC BY CIFOR

III. THE EMERGENCE OF RESTORATION

Global recognition of forest and landscape restoration emerged in response to mounting evidence that we are depleting natural resources in a way that threatens grave consequences. Desertification, deforestation, water shortages, pollution, biodiversity loss and climate change are some of the challenges that underline how we urgently need development models that improve human well-being without damaging the environment.

The will to address these challenges is anchored in international law, including in the agreements sealed at the United Nations Earth Summit in Rio de Janeiro

in 1992: the Convention on Biological Diversity, the Framework Convention on Climate Change and the Convention to Combat Desertification.

NATIONAL AND GLOBAL GOALS

Restoration can make a big contribution to meeting countries' commitments under all three of these treaties: for instance, by restoring habitat for endangered wild animals and plants, preserving and enhancing vital forest and peatland carbon sinks, and maintaining the protection of soil and water resources that tree cover provides.

Moreover, forests and landscapes will be vital in meeting the goals of the 2030 Agenda for Sustainable Development. This applies most directly to Goal 15 (Figure 2), but also to those addressing poverty, food security, health and well-being, and water and sanitation.

FIGURE 2 SDG 15 IS ONE OF SEVERAL GOALS THAT RESTORATION CAN HELP ACHIEVE

PROTECT, RESTORE AND PROMOTE SUSTAINABLE USE OF TERRESTRIAL ECOSYSTEMS, SUSTAINABLY MANAGE FORESTS, COMBAT DESERTIFICATION, AND HALT AND REVERSE LAND DEGRADATION AND HALT BIODIVERSITY LOSS.

World leaders recognized the need to intensify restoration efforts in 2011 by backing the world's largest restoration initiative. The Bonn Challenge aims to have brought 150 million hectares of degraded landscapes into restoration by 2020. In 2014, leaders meeting in New York called for the restoration of an additional 200 million hectares by 2030, a target incorporated into the Bonn Challenge. The New York Declaration on Forests also outlines other ambitious goals, including eliminating deforestation from agricultural commodity supply chains and strengthening forest governance.

FIGURE 3 GLOBAL RESTORATION COMMITMENTS

As of 2018, more than 50 countries and other entities including India, Ethiopia, Mexico and Peru have committed to bringing more than 160 million hectares into restoration. Figure 3 shows all of the countries and entities who have made commitments.

Landscape restoration in Ethiopia.
© TerrAfrica Partnership & Andrea Borgarello

FIGURE 4 PRINCIPLES OF FOREST AND LANDSCAPE RESTORATION (FLR)

FLR is defined as a process that aims to regain ecological functionality and enhance human well-being in deforested or degraded landscapes. FLR is not an end in itself, but a means of regaining, improving, and maintaining vital ecological and social functions, in the long-term leading to more resilient and sustainable landscapes.

FOCUS ON LANDSCAPES

FLR takes place within and across entire landscapes, not individual sites, representing mosaics of interacting land uses and management practices under various tenure and governance systems. It is at this scale that ecological, social and economic priorities can be balanced.

ENGAGE STAKEHOLDERS AND SUPPORT PARTICIPATORY GOVERNANCE

FLR actively engages stakeholders at different scales, including vulnerable groups, in planning and decision making regarding land-use, restoration goals and strategies, implementation methods, benefit sharing, monitoring and review processes.

RESTORE MULTIPLE FUNCTIONS FOR MULTIPLE BENEFITS

FLR interventions aim to restore multiple ecological, social and economic functions across a landscape and generate a range of ecosystem goods and services that benefit multiple stakeholder groups.

MAINTAIN AND ENHANCE NATURAL ECOSYSTEMS WITHIN LANDSCAPES

FLR does not lead to the conversion or destruction of natural forests or other ecosystems. It enhances the conservation, recovery, and sustainable management of forests and other ecosystems.

TAILOR TO THE LOCAL CONTEXT USING A VARIETY OF APPROACHES

FLR uses a variety of approaches that are adapted to the local social, cultural, economic and ecological values, needs, and landscape history. It draws on latest science and best practice, and traditional and indigenous knowledge, and applies that information in the context of local capacities and existing or new governance structures.

MANAGE ADAPTIVELY FOR LONG-TERM RESILIENCE

FLR seeks to enhance the resilience of the landscape and its stakeholders over the medium and long-term. Restoration approaches should enhance species and genetic diversity and be adjusted over time to reflect changes in climate and other environmental conditions, knowledge, capacities, stakeholder needs, and societal values. As restoration progresses, information from monitoring activities, research, and stakeholder guidance should be integrated into management plans.

PARTNERSHIP AND PRINCIPLES

The Bonn Challenge, New York Declaration on Forests and several regional initiatives (see Section IV) are led and/or supported by members of the Global Partnership on Forest and Landscape Restoration. Launched in 2003, the Global Partnership brings together governments, organizations, research institutes, communities and individuals with the goal of restoring the world's lost and degraded forests and their surrounding landscapes.

The Global Partnership catalyses voluntary action by sharing experiences on restoration efforts that deliver benefits to both communities and nature through a landscape approach, while also fulfilling international environmental commitments. The Partnership has developed principles to establish a common understanding on forest and landscape restoration and guide the efforts of its members (Figure 4).

Woman in Niger collecting firewood.
© TerrAfrica Partnership & Andrea Borgarello

The members of the Partnership are helping countries with capacity building, assessment[14], implementation and monitoring, for example through the Bonn Challenge Barometer[15] and the Action Plan on Ecosystem Restoration[16].

The restoration drive has been further strengthened with the creation of the Global Restoration Council[17]. The Council supports the efforts of the Partnership – particularly at a political level – to secure strong, long-term commitments. Other initiatives and actors are also making valuable contributions to the overall forest and landscape restoration effort.

In parallel to the growing number of restoration efforts on the ground, technical support for planning and implementation is expanding and becoming more accessible and tailored to needs. Technical capacity is in place to help countries and local governments to understand where restoration is applicable and how to go about it. Restoration commitments are increasingly aligned with national and sub-national policy objectives on climate, biodiversity and desertification. This indicates the depth of support for restoration as an integral part of sustainable development programming.

14 A key tool of the Global Partnership is the "Restoration Opportunities Assessment Methodology – ROAM"

15 International Union for Conservation of Nature, 2017. Bonn Challenge Barometer of Progress: Spotlight Report 2017.

16 Parties to the Convention on Biological Diversity adopted the action plan in 2016 (Decision XIII/5).

17 More information on the Global Restoration Council is available on the World Resources Institute website: www.wri.org/our-work/project/global-restoration-initiative/global-restoration-council

© CC BY CIFOR

IV. RESTORATION IN ACTION

The flexibility of forest and landscape restoration is its strength. It is being adapted and applied in many different situations. That means there is no such thing as a "typical" restoration project. The most common characteristic is that forest and landscape restoration aims to simultaneously improve the livelihood, biodiversity, and climate benefits of landscapes.

SUCCESS STORIES

Five examples of forest and landscape restoration projects are showcased in this report. They illustrate the range of objectives achieved, the contexts in which restoration can be applied (depending on factors such as climate, topography and land use history), the tailor-made approaches available, and the wide range of people who benefit.

More case studies from across the world can be found on the website of Global Partnership on Forest and Landscape Restoration: www.forestlandscaperestoration.org. They include:

- A project in **Chile** to establish payments to farmers restoring riparian areas and improving the management of their cattle in order to protect water supplies for people living downstream.
- **Costa Rica**, where partners have been buying land hectare-by-hectare for 25 years to restore the Nosara River Basin, improving water supply, creating jobs, and setting aside protected areas.
- A national effort in **Ghana** that includes establishing commercial teak plantations and reintroducing native tree species.
- **Guatemala**, where the culturally significant and multi-use breadnut tree is a cornerstone of a restoration initiative that boosts nutrition and food variety for local communities.
- **Madagascar**, where restoration of the Fandriana-Marolambo landscape has included planting 800,000 indigenous trees and establishing new economic activities including pig rearing, essential oils, fruit trees and beekeeping.
- **Niger** and **Ethiopia**, where low-cost "Farmer Managed Natural Regeneration" has yielded significant benefits. Re-growing indigenous trees and shrubs from stumps, sprouting root systems or seeds has helped ease food insecurity.
- The planting of fruit and fodder trees to boost livelihoods and stabilize terraced farmland in **Rwanda**.
- **Turkey**, where restoration of 2.3 million hectares includes significant planting, soil and water protection, restoring tree cover along roadsides and establishing green belts around cities.

Ethiopian farmer with tree seedlings.
© TerrAfrica Partnership & Andrea Borgarello

REGIONAL INITIATIVES

The global push for forest and landscape restoration and the increased ambition shown by countries have fostered several regional political spaces as well as technical platforms. These are contributing to the achievement of global restoration goals and helping move more countries from political commitments to on-the-ground implementation. They also reflect how restoration is being shaped to address the needs and realities of particular regions.

Key regional platforms include:

Latin America and the Caribbean

- Initiative 20x20 is helping governments, civil society and the private sector to bring at least 20 million of hectares of land into restoration by 2020. Launched in 2014, the initiative takes a three-pillared approach: securing political commitment; analysing restoration opportunities; and creating a supportive financial mechanism for implementation. More than $2 billion in support has been secured from impact investors.

- A regional Bonn Challenge ministerial dialogue began in 2015 in El Salvador, followed to date by yearly meetings in Panama, Honduras, and Guatemala. These meetings are resulting in new pledges and focusing on concrete actions, as well as providing a platform for the design of regional roadmaps for scaling up restoration with a different focus each year: South-South collaboration, policy and governance, job generation and investment through public-private partnerships, and mainstreaming restoration across sectors.

Africa

- AFR100, or the African Forest Landscape Restoration Initiative, aims to bring 100 million hectares of degraded landscapes into restoration by 2030. Twenty-six countries have pledged to restore more than 84 million hectares since the effort was launched in 2015. The initiative is supported by 12 technical partners, and nine financial partners. Support includes $1 billion from the World Bank Africa's Climate Business Plan and nearly $500 million from private impact investors.

- High-level roundtable meetings in Africa have translated ministerial vision and political will on restoration into political instruments: the 2016 Kigali Declaration on Forest Landscape Restoration in Africa; the 2017 Lilongwe Call for Action; and the 2018 joint Funding Strategy for Central African Forests Commission countries. These dialogues have catalysed new pledges and helped identify opportunities to share information, develop financial cooperation, and increase capacities for restoration.

Landscape restoration in Alvelal, Spain.
© Commonland

Mediterranean

- In 2017, nine countries signed the Agadir Commitment towards an initiative that will reinforce regional cooperation and restore 8 million hectares of degraded forest landscapes by 2030. It also foresees cooperation on restoration with the Sahel region. The signatories are Algeria, France, Iran, Lebanon, Morocco, Portugal, Spain, Tunisia, and Turkey.

Asia-Pacific

- In 2017, the Asia-Pacific Forestry Commission endorsed a Regional Strategy and Action Plan for Forest and Landscape Restoration. National restoration strategies will follow, as well as strengthened regional dialogue, collaboration and coordination.

- A first regional high-level dialogue was held in Indonesia in 2017 and a second is planned for Sri Lanka in late 2018. The Indonesia meeting resulted in four pledges that pushed the Bonn Challenge past the 150 million hectares milestone and highlighted the role of sub-national jurisdictions in restoration.

Caucasus and Central Asia

- In 2018, six countries pledged to bring over 2.5 million hectares of forest landscape into restoration by 2030. At their first ministerial roundtable, Armenia, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan also adopted the Astana Resolution committing the region to go beyond the 2.5 million hectare target and to track progress using the Bonn Challenge Barometer.

These initiatives are encouraging exchanges of experiences with implementation, regional coordination of national or transboundary activities, political and technical networking, building of trust and cooperation among governments and better common understanding of the contribution of restoration to achieving national as well as international environmental and sustainable development priorities. The Global Partnership invites additional stakeholders to get involved in these initiatives.

© CC BY CIFOR

V. FINANCING RESTORATION

Funding for forest and landscape restoration is increasing. However, meeting global targets and unlocking all the benefits of restoration requires significantly higher levels of investment. Estimates suggest that more than $837 billion are needed to reach the 350 million hectare restoration target by 2030[18].

18 FAO & Global Mechanism of the UNCCD, 2015. Sustainable financing for forest and land scape restoration: Opportunities, challenges and the way forward.

While increased support from governments and international financial bodies will be vital to scaling up restoration, much of this funding will have to come from private sources.

INVESTMENT OPPORTUNITIES

Studies have shown that the economic benefits of restoration can far exceed the costs[19]. Returns on private investment in forest and landscape restoration could also be high. However, it can be hard for private investors to turn some of the benefits – e.g. climate stabilization, improved wildlife habitat, or aesthetic landscape values – into financial income, weakening the business case for investment.

Restoration is best suited to attract private investment when it generates direct economic benefits that can be captured by a private actor, such as sustainable and higher agriculture or timber yields, agriculture diversification/resilience and market premiums on products from restoration.

The development of markets that provide payment for ecosystem services, particularly those created or revived by restoration, will be critical to attracting more private investment. Other factors holding back private investors include: risk surrounding the legal, technical and financial feasibility of restoration projects; a shortage of investment-ready opportunities; limited support for project development; and limited capacity among partners in developing countries.

Tackling these factors will be important to ramping up the scale of both public and private investment in restoration. This situation has similarities with the renewable energy sector in the 1990s, when investments in wind and solar power were seen as risky and lacking a clear business rationale. As in that case, governments who are willing to take the lead, innovative new business models, the removal of perverse incentives, and steadily falling costs can open the way for private investment to drive the scaling up of restoration.

UNLOCKING CAPITAL

Governments can help unlock significant capital for restoration with measures including[20]:

19 Verdone, M. and Seidl, A., 2017. Time, space, place, and the Bonn Challenge global forest restoration target. Restoration Ecology, 25: 903-911.

20 World Resources Institute, 2017. Roots of Prosperity: The Economics and Finance of Restoring Land.

- **Redirecting incentives.** Incentives including agricultural subsidies which make it profitable to degrade land should instead encourage increased productivity on existing agricultural land [21] or the rehabilitation of degraded land for productive purposes.

- **Introducing carbon prices.** Allocating the proceeds from carbon taxes or auctioned emissions permits to climate solutions such as restoration will improve their effectiveness in mitigating climate change.

- **Leveraging climate finance**. Climate funds should explicitly acknowledge restoration as part of their climate mitigation and adaptation strategies and reduce bureaucracy in the application processes.

- **Mitigating risk.** Governments, development banks and others can mitigate risk for private investors through, for instance, insurance guarantees, tax credits and first-loss capital structures.

- **Bundling projects.** Aggregating projects would increase investment size and enhance liquidity while reducing project-specific risk through diversification.

Public investments creating value chains that reward restoration can potentially create jobs to grow local economies and produce revenues from tax collection. These revenues could in turn support other sectors such as education, health and infrastructure. The members of the Global Partnership on Forest and Landscape Restoration can help to create a critical mass of economically viable and successful restoration projects, build critical partnerships between different sectors, and further clarify and communicate the business case for restoration investments.

21 McFarland, W., Whitley, S. and Kissinger, G., 2015. Subsidies to key commodities driving forest loss. Overseas Development Institute.

© Afifi Zulkifle

VI. MAKING RESTORATION GLOBAL

Through years of hard work, the proponents of restoration have given shape and direction to an important idea. Members of the Global Partnership on Forest and Landscape Restoration and many other entities have argued the merits of restoring the health, productivity and resilience of our land and forests. They have explained how it can help meet several goals – from the local to the global – at the same time. They have collected pledges, found financial support, and run pilot projects. They have trained, analysed and documented all aspects of the process.

These efforts have brought the restoration movement to an important threshold. Crossing it, and scaling up restoration to match the opportunity that it represents, means absorbing the valuable lessons learnt thus far, making the case even more persuasively to decision-makers, and redoubling efforts to support implementation. Below are some of the key areas where progress will be important.

LEADERSHIP, VISIBILITY AND REACH

Restoration must be global in ambition, decentralized in practice. Governments everywhere should establish and strengthen national and sub-national restoration efforts. Regional initiatives can foster improved governance and decision-making, while allowing countries and stakeholders with similar challenges and circumstances to share experiences and collaborate in finding solutions.

Restoration must be seen as a solution for the economy as well as the environment. Making the case for restoration means explaining that its costs are far outweighed by its benefits, including job creation in rural areas. It is also vital to explain how adding trees to landscapes enhances food production and livelihoods, and to dispel misperceptions that restoration creates competition between forests and other land uses including food production.

The restoration message must reach decision-makers at the highest levels. Proponents must make the case for restoration to bodies such as the High-level Political Forum on Sustainable Development, the Group of Twenty and the Group of Seven as well as regional political organizations and national governments. Political traction at the highest level is essential to bringing restoration into the mainstream and achieving global restoration targets. This effort should include strengthening the Global Partnership on Forest and Landscape Restoration and ensuring it has the necessary resources.

STRENGTHENING THE FRAMEWORK

Countries need more support to realize their restoration commitments. Countries that have made ambitious commitments must receive more support in applying the principles of restoration to their own deforested and degraded lands. Stronger guidance, tools and other support will help them to do that. Countries must also continue their work to establish baselines and criteria (biophysical and socio-economic) for assessing whether restoration work is on track and meeting objectives.

Cost-effective monitoring schemes must be established. Strong monitoring schemes will help governments oversee the implementation of restoration projects and measure progress toward meeting domestic goals and international obligations. Systematic monitoring also will yield the consistent, comparable information needed to measure costs and benefits, refine practice over time and make the case for restoration around the globe.

Technical, financial and capacity support must be decentralized. As implementation ramps up, support should be increased and increasingly focused at regional, national or sub-national level where implementation takes place.

SCALING UP INVESTMENT

Public funding should be stepped up. National and sub-national governments should appreciate the full range of benefits – economic, social and environmental – of restoring degraded forests and landscapes and reflect them in their budgets as well as their policies and programmes. Low-cost but large-scale programmes can focus on natural regeneration.

Policymakers must promote and incentivize private sector investment. Engaging the private sector is vital to close the financing gap and bring global restoration goals within reach. Engagement includes policies to incentivize sustainable agriculture and create markets for ecosystem services such as water supply.

Public climate finance should be more accessible. While nature-based responses to climate change offer more than 30 per cent of the solution[22], they receive less than 3 per cent of climate finance[23]. Finance should be made more easily available for forest and landscape restoration. Climate funds should simplify the application process and emphasize restoration action. Carbon markets are an emerging means to raise funding for natural climate solutions including restoration. However, other ecosystem benefits of restored landscapes, in particular freshwater availability and quality, could also provide significant resources for restoration.

Capacity-building and project preparation need support. Investment needs to be channelled also into project preparation so that investors (both

22 Griscom, B.W. et al., 2017. Natural Climate Solutions. Proceedings of the National Academy of Sciences of the United States of America.

23 Buchner, B.K. et al, 2017. Global Landscape of Climate Finance. Climate Policy Initiative.

Plant nursery in Yangambi, DRC.
© Axel Fassio/CIFOR

public and private) have more opportunities and more security about the feasibility of restoration projects. More funding is needed for capacity-building, especially for organizations in developing countries who could partner with businesses as well as governments.

DEEPENING COMMITMENTS

Restoration needs to target benefits as well as hectares. Pledges should target outcomes based on the benefits people receive and real improvement in environmental and ecological conditions. Explicit links need to be articulated between restoration pledges and their outcomes for sustainable agriculture, food security, livelihoods, healthy rural economies, etc. Making these links requires direct and meaningful engagement of local stakeholders in the design, implementation and evaluation of restoration projects and programmes.

Countries should embed restoration into national and sub-national policies and programmes. As implementation must ultimately be tailored to local needs and circumstances, there is a need to translate broad policy objectives into specific actions for targeted results. Programmes should include action to prevent further deforestation and degradation as well as to promote restoration.

Restoration must be a cross-sectoral effort. Restoration must transcend sectoral barriers including those between agriculture, forestry, environment and finance ministries. This effort requires new ways of doing business at all levels, including the landscape level. It also must draw in researchers, civil society and the private sector.

Restoration must embrace a wide range of stakeholders. Effective restoration projects with economic, social and environmental goals must embrace a wide range of stakeholders, including academia, civil society, indigenous groups, local communities, and the private sector. Broad-based approaches can help in, for example, developing regulations, targeting investment and sharing benefits. Particularly important are the hundreds of millions of smallholder families living at the intersection of forestry and agriculture.

Restoration must be for everyone, and for the long-haul. While large-scale efforts are important in catalysing action, the cumulative impacts of many small-scale initiatives over long timeframes will also make a big contribution to global targets. Much of the work ahead will be done quietly and inexpensively by people pursuing better lives and livelihoods for themselves and their children. With the support of governments, experts, donors, and international bodies including the Global Partnership on Forest and Landscape Restoration, they can help drive a transformational shift toward a sustainable future.

The restoration of forests and landscapes as described in this report is a holistic approach to addressing urgent challenges faced today by societies all over the world. By restoring ecosystem health and at the same time improving people's quality of life, forest and landscape restoration concerns the very foundation of life on Earth: it aims to restore the ecological basis of humanity's economic and social activity. Restoring degraded forests and landscapes worldwide is an indispensable, urgent and feasible action for achieving the Sustainable Development Goals.

ANNEX
CASE STUDIES

Further case studies are available on the website of the Global Partnership on Forest and Landscape Restoration:

www.forestlandscaperestoration.org

KEEPING CATTLE FROM THE RIVERBANK PAYS IN BRAZIL

Cattle farmers in a hilly area of Brazil are earning good money for protecting drinking water supplies to the mega-city of Sao Paolo – and are restoring 3,000 hectares of farmland and forest in the process[24].

The project in the Municipality of Extrema is an example of a payment-for-ecosystems-services approach that creates a market for a good that private business wouldn't otherwise provide. As well as cleaning up water supplies, it has produced a 60 per cent jump in tree cover in the sub-basin where it began.

Much of the forest in Extrema and other parts of Minas Gerais State has been replaced by beef and dairy farms. The resulting increase in soil erosion hurts the water quality in the system of reservoirs that supply over 10 million people in the Sao Paolo metropolitan region.

Under the scheme, farmers are planting native trees along the banks of streams and rivers to control erosion. About 170,000 metres of new fencing prevents livestock from trampling the vegetation and defecating in the water.

When it began in 2007, the Water Conservation Program was the first of its kind in Brazil. It has secured contracts with more than 100 landowners representing about 90 per cent of the land area of the municipality.

Extrema landscape and farms.
© Robin Chazdon

24 World Resources Institute supplied information for this case study.

São Paulo, Brazil
© Deni Williams

The landowners receive $118 per year for every hectare of grazing land turned over to restoration planting. The payments cover both the costs of restoration and income foregone. The contracts also cover management of remnant forest patches and soil conservation measures. Bio-digesters treat wastewater on some of the farms. Small reservoirs have been built on others.

National water conservation policies were important in the establishment of the program. Policy supported the emergence of watershed committees bringing together local stakeholders and the establishment of the payments scheme.

To encourage farmers to participate, program managers have designed customized restoration plans for individual parcels of land, and have provided labour for the restoration work. Authorities including the National Water Agency as well as private firms have helped fund the project. Non-governmental organizations have supplied seedlings.

THE "CRAZY" REWARDS OF FENCED PLOTS IN BURKINA FASO

A long-running agroforestry initiative in Burkina Faso is helping carefully selected farming families to realize the myriad benefits of nurturing trees in fenced plots, each of which becomes an ever-more-convincing demonstration site for its neighbours[25].

The initiative is guided by tiipaalga, a Ouagadougou-based association that has been promoting sustainable resource management to alleviate poverty in the West African country for more than a decade. Bioversity International is researching the benefits of this approach and how it can be applied more widely.

Drought, deforestation and overgrazing have degraded vast tracts of land in Burkina Faso. Soils in many areas are exposed to erosion from wind and rain, and are short of organic matter. Once common tree species are now rare or absent from many regions.

Amid growing concern about the region's vulnerability to the impacts of climate change, demand for tiipaalga's support is high. However, the organization applies strict selection criteria in order to minimize the risk of failure: farmers must demonstrate their commitment to what is a long-term project; they must have a plot of about 3 hectares with clear tenure rights; and an agreement must be signed by the smallholder, his or her neighbours and local authorities.

"When we began, everyone in the villages thought we were crazy to want to fence off lands to restore them. The first partners to accept to be 'crazy' like us reaped beautiful results. Donors also had to believe in us and to be patient to observe results, since tree regeneration takes time."

Alain Traoré,
director of
Association tiipaalga

25 Bioversity International supplied information for this case study.

Tiipaalga supplies durable fencing materials, saplings and longer-term support to help families establish and manage their plots and trees. The approach favours natural regeneration but can also include enrichment planting with particularly valuable species. The fence protects the growing trees from woodcutters as well as grazing animals.

The benefits include harvests of fruit, fodder and firewood, soil regeneration and the cultivation of tree species used in traditional medicine. Some families establish tree nurseries or keep bees. Other families plant crops between the trees or use the area to produce hay or thatch. Tiipaalga also promotes clean cookstoves that burn less wood.

Wider benefits include improved resilience in the face of a changing climate, enhanced biodiversity and the protection of rare and endangered tree species. So far, several hundred hectares of land has been fenced and restored in this way. According to Tiipaalga director Alain Traoré, the approach has rebuilt faith in the possibility of greening the Sahel region, and given rural families belief that they can leave a healthy legacy to their children.

Fenced plots in Burkina Faso
© Bioversity International

Village in Nepal surrounded by modified forest and agriculture.
© Prem Prasad Sharma, Nepal Mandala

COMMUNITIES IN NEPAL TAKING LANDSCAPES INTO THEIR OWN HANDS

Visitors trekking past Nepal's Phewa Lake toward the snowy peaks of the Himalayas are enjoying a scene invigorated by four decades of community-based landscape restoration[26].

As well as supporting the tourism business around the city of Pokhara, the greening of fields and forests improves local livelihoods by boosting agriculture as well providing more fuelwood and clean water. By countering soil erosion from the monsoon rains that lash the hilly terrain, restoration has cut the volume of sediment entering the lake. Overall, forest cover across the Phewa watershed has increased by about 12 per cent since the 1970s.

Key to this success has been a supportive national forest policy. This has allowed local communities to obtain the right to use – and the incentive to manage – the resources of the forest. Also important was growing concern at how degradation had undermined farm outputs and the supply of forest products.

26 Centre for International Forestry Research supplied information for this case study.

Today, about 75 forest user groups, representing more than 12,000 households, manage some 2,700 hectares of forest in the watershed under the community forestry system.

With support from local authorities and non-government organizations, communities have planted native tree species and encouraged natural regeneration of the forests. They have devised local rules for the use of resources such as wood and fodder.

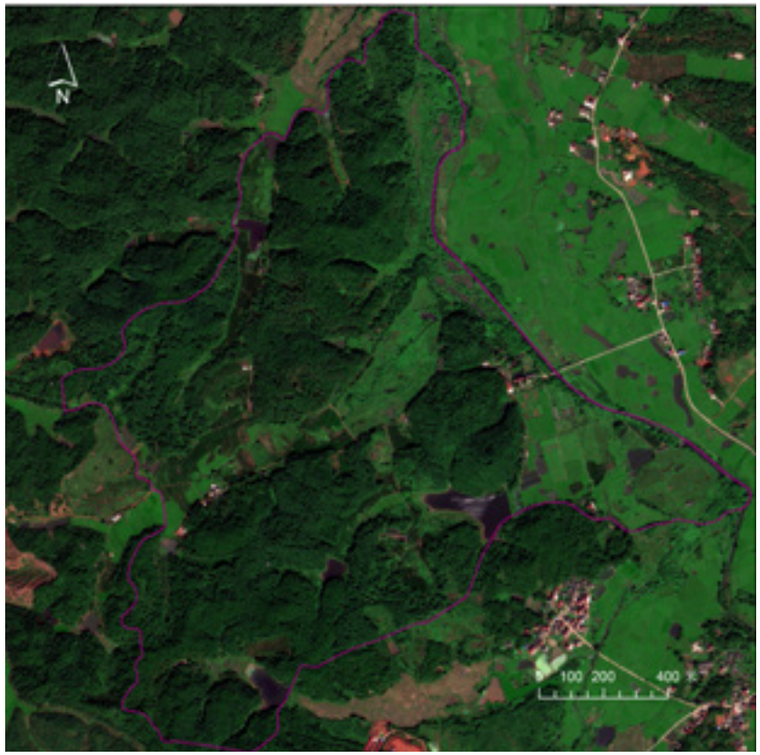
Farmers have terraced the land on steep slopes to further reduce erosion. Livestock are fewer and are kept in stalls, allowing degraded lands to recover and become a source of harvestable grasses. With more wood available, farmers can use the animals' dung as fertilizer instead of fuel. Women have more time for productive tasks because it is now easier to collect fodder, wood and water.

Phewa Lake, Nepal
© CC NC BY Funmilayo

MODEL RESTORATION IN THE RED SOILS OF SOUTHERN CHINA

The challenge of feedings the world's largest population means China cannot afford to lose productive landscapes to soil degradation. The concern prompted a long-term restoration effort in the country's red soil hilly regions that is delivering significant benefits for people and planet[27].

By the 1980s, the red soil regions of southern China had suffered serious erosion as a result of deforestation and unsustainable farming practices. Wide areas were denuded of trees and vulnerable hillsides riven with erosion gullies. Depleted soils retained little water.



Remote sensing image of Qianyanzhou demo site in 2015.
© UN Environment

27 UN Environment supplied information for this case study.

To work out how best to restore it, scientists established a demonstration site in Qianyanzhou. In 1982, only seven households remained there, and were using just 11 per cent of the land. A careful land-use plan was drawn up, with the upper hills reforested, citrus orchards on moderate slopes and rice paddies in the valley bottoms. Dams among the hills would store rainwater.

Within a few years, this mosaic of sustainable land use was already yielding higher incomes. Biodiversity and environmental quality as well as the micro-climate improved. By 1995, the number of households had risen tenfold to 70, and the annual per capita income had jumped from about $80 to about $350 – more than three times higher than in a nearby village outside the project area.

By 2000, more than 40 other sites covering a total area of 26,700 hectares had applied the Qianyanzhou model and generated multi-million dollar benefits.

Since then, the model has been strengthened by the transformation of its plantation forest to something closer to the native forest structure in this humid, subtropical region, and by introducing poultry breeding to diversify local livelihoods.

A key element in the approach was agroforestry: farmers continued to grow cash crops such as peanuts, sesame and vegetables among the restored orchards. This ensured economic returns in the early stages and helped raise soil fertility. As well as building dams and ponds, government agencies provided loans to households to help them get started.

The positive results in Qianyanzhou also rest on close collaboration between institutions such as the Chinese Academy of Sciences, government agencies – who provided land, manpower and finance – and local communities. The effort contributed to an increase in China's total forest area of 74.3 million hectares in just a decade.

REGENERATING AN AMERICAN FOREST FOR JOBS, WILDLIFE AND FIRE PROTECTION

As well as improving rural livelihoods in developing countries, restoration can also help lift the quality of existing forests in wealthier regions, such as those in the Rocky Mountains of the United States[28].

In the State of Colorado, the United States Forest Service is working with an array of public and private sector partners to restore 230,000 hectares of forest on the Uncompahgre Plateau. Factors from logging and grazing to drought and climate change have affected the forests here. Studies suggest they are at risk from high intensity wildfire and from insects and disease.

Restoration work is reducing those risks and the threat they pose to neighbouring communities, and to secure flows of clean water to the mighty Colorado River and downstream settlements. It is improving habitat for native species such as the Colorado cutthroat trout and creating jobs, also by securing timber supplies to the last large sawmill in the state.

Since 2010, over 12,500 hectares have been restored or enhanced. Machinery and prescribed burning have been used to clear unwanted vegetation and assist the natural regeneration of the forest. Some 1,800 hectares have been treated for noxious weeds. More than 1,000 kilometres of trails have been improved to reduce erosion and improve access for recreation. The project has created or maintained an average of 117 full and part-time jobs and over $4 million in labour income each year.

Post restoration in project site @ US Forest Service

Landscape shot with young trees in project site @ US Forest Service

28 United States Forest Service supplied information for this case study.

The project sets great store on community engagement. Youth and school groups are invited to take part in the restoration work and learn about the forest ecosystem. Universities and citizen scientists are involved in monitoring efforts. Private landowners and businesses are consulted and engaged.

Forest landscape in Colorado, United States © Breanna Galley

THE MEMBERS OF THE GLOBAL PARTNERSHIP ON FOREST AND LANDSCAPE RESTORATION:

Bioversity International
bioversityinternational.org

Center for International Forestry Research (CIFOR)
cifor.org

Commonland
commonland.com

Convention on Biological Diversity (CBD) Secretariat
cbd.int

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Germany (BMU)
bmu.de

Food and Agriculture Organization of the United Nations (FAO)
fao.org

Forest Stewardship Council (FSC)
fsc.org

French Agricultural Research Centre for International Development (CIRAD)
cirad.org

Global Environment Facility (GEF)
thegef.org

International Model Forest Network (IMFN)
imfn.net

International Tropical Timber Organization (ITTO)
itto.int

International Union for Conservation of Nature (IUCN)
iucn.org

International Union of Forest Research Organizations (IUFRO)
iufro.org

Ministry of Agriculture, Nature and Food Quality of the Netherlands
government.nl/ministries/ministry-of-agriculture-nature-and-food-quality

NEPAD Agency
nepad.org

Norway's International Climate and Forest Initiative (NICFI)
norad.no/nicfi

Society for Ecological Restoration (SER)
ser.org

Switzerland Federal Department of Foreign Affairs (FDFA)
fdfa.admin.ch

Tropenbos International
tropenbos.org

United Nations Environment Programme
unenvironment.org

UN Environment World Conservation Monitoring Centre (UNEP-WCMC)
unep-wcmc.org

United Nations Convention to Combat Desertification (UNCCD) Secretariat
unccd.int

United States Forest Service
fs.fed.us

Wageningen Centre for Development Innovation
wur.nl

WeForest
weforest.org

World Agroforestry Centre (ICRAF)
worldagroforestry.org

World Bank Program on Forests (PROFOR)
profor.info

World Resources Institute (WRI)
wri.org

World Vision
worldvision.org

Restoring the world's ecosystems is vital to achieve the goals of the 2030 Agenda for Sustainable Development. By supporting the Bonn Challenge, New York Declaration on Forests and several regional initiatives, the Global Partnership on Forest and Landscape Restoration brings together various stakeholders under a common goal: to restore the world's lost and degraded forests and their surrounding landscapes. This publication highlights the emerging consensus and urgency to create sustainable, resilient landscapes for climate mitigation and adaptation, biodiversity conservation, as well as human health and well-being.

THE GLOBAL PARTNERSHIP ON FOREST AND LANDSCAPE RESTORATION