GLOBAL RESTORATION COMMITMENTS AND PLEDGES: 2024 REPORT

An Overview of Global Restoration Commitments: Gaps, Opportunities, and Pathways Forward

Muneeswaran Mariappan, and Andrés Rodríguez Zumbado

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Database for Global Restoration Database and Pledges 2024 Report

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EXECUTIVE SUMMARY

The Global Restoration Commitments Database 2024 Report analyses restoration commitments worldwide, offering insights into the current progress, challenges, and opportunities for enhancing ecosystem restoration efforts. Developed to support global restoration goals and address pressing environmental challenges, the database consolidates diverse data on restoration pledges and creates a standardised, transparent framework for monitoring global commitments.

This report aligns restoration commitments with international frameworks, such as the Bonn Challenge, the United Nations Rio Conventions, and the Sustainable Development Goals (SDGs). By gathering data across multiple initiatives, the database allows stakeholders to track achievements, assess resource needs, and evaluate progress toward global restoration targets. Significant gaps and inconsistencies in funding, policy integration, and data transparency limit restoration efforts. Despite increased international commitments, financing for nature-based solutions remains insufficient and inconsistently allocated, highlighting the need for improved financial flows and new funding mechanisms.

The methodology employed in the Global Restoration Commitments Database builds on the foundational framework established by Sewell et al. (2020), ensuring consistency with previous datasets while incorporating updates to reflect current restoration goals. Through a systematic approach, restoration pledges are categorised by land use types, hectares committed, and primary restoration goals, providing a comprehensive view of restoration commitments at the global scale. However, data collection, standardisation, and cross-sectoral alignment challenges emphasise the need for stronger international cooperation and policy coherence.

The report recommends establishing a complementary global restoration achievements database to support the effective realisation of restoration goals and provide a transparent and reliable source for tracking restoration progress. Standardised data collection protocols, improved funding mechanisms, and inclusive decision-making processes are crucial elements to address existing gaps and promote a more integrated, sustainable approach to global restoration efforts. These actions aim to create an environment that supports comprehensive restoration outcomes by fostering collaboration across sectors and prioritising capacity-building for developing countries.

The Global Restoration Commitments Database 2024 Report serves as a baseline for consistent data tracking and emphasises the importance of a unified restoration framework. This report underscores the potential for meaningful progress toward achieving global

restoration and climate resilience goals by addressing current limitations and leveraging collaborative opportunities.

The restoration commitment data reported in this report has been extracted from publicly available sources using the methodology presented in the report. The database was last updated on September 20th, 2024, and will be updated periodically. Should you have any questions about the data reported here or wish to provide updated data, please contact muneeswaran.mariappan@iucn.org.

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Acronyms

Acronym	Full Form
CBD	Convention on Biological Diversity
FAO	Food and Agriculture Organization
GIS	Geographic Information System
IUCN	International Union for Conservation of Nature
LDN	Land Degradation Neutrality
NBSAP	National Biodiversity Strategies and Action Plans
NDC	Nationally Determined Contributions
RIO	Rio Conventions (CBD, UNCCD, UNFCCC)
SDGs	Sustainable Development Goals
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change

1.0 Database for Global Restoration Commitments and Pledges 2024 Report

Rationale and Purpose

This technical note describes the methodology behind the updated database on Global restoration commitments and underscores its significance. The appendix includes an excerpt of the data per country, providing a comprehensive view of global efforts towards ecosystem restoration. This report uses the term "ecosystem restoration" to refer to land-based ecosystems, including terrestrial and inland wetland ecosystems. Marine ecosystems are not encompassed within this scope. This focus aligns with the objectives of land restoration commitments and associated global frameworks covered in this document.

The **Global Restoration Commitments Database** consolidates national and international land restoration efforts and offers a standardised, transparent view of restoration progress worldwide. Through a consistent data collection and reporting approach, this database provides stakeholders with a comprehensive resource to track achievements, monitor progress, and identify gaps in restoration targets. The appendix includes a country-by-country summary of restoration data, giving a broad view of global ecosystem recovery efforts.

Introduction

Land degradation is not just a threat; it is a crisis. Pressures from global climate change and regional human impacts drive ecosystem collapse, emphasising the urgency of addressing the complex interactions that lead to ecosystem degradation (Bergstrom et al., 2021). It profoundly jeopardises human well-being and the planet's health. The degradation of biodiversity in human-populated areas threatens ecosystem processes relevant to human well-being (Abrego et al., 2020). Land degradation leads to the loss of ecosystem services, threatening social well-being (sharafatmandrad & Mashizi, 2021). Over 2 billion hectares of land suffer from land degradation, leading to alarming deforestation rates, biodiversity loss, loss of ecosystem services and increased vulnerability to climate change (Wang et al., 2023; Gatti et al., 2021; Borrelli et al., 2017). The expansion of land degradation may cause the destabilisation of ecosystems' structure, services, and functioning, comparable to a global health crisis such as the COVID-19 pandemic, underscoring its pervasive and severe impacts (Munoz-Rojas et al., 2020). The destruction of natural areas reduces biodiversity and ecosystem services and increases human health risks (Bradby et al., 2021). Additionally, the aridification of more than 20% of the terrestrial surface has heightened vulnerability to climate variability and change, affecting essential ecosystem services for the 2 billion people living in drylands. Amplified by climate change, these environmental changes threaten the sustainability of land use, which is fundamental to human well-being (Estaque et al., 2023)

and achieving sustainable development goals focused on creating a world with zero net land degradation (Petrosillio et al., 2023).

The manifestation of widespread ecosystem collapse is a stark warning of the necessity to take action (Bergstrom et al., 2021). Conversion of logged forests into oil palm plantations results in the collapse of most energetic pathways (Malhi et al., 2022). Agricultural intensification and increased drought frequency duration and severity may have landscape-level consequences for ephemeral ecosystems, leading to their degradation or destruction through poor land-use practices (Dalu et al., 2016). Afforestation and abandonment of semi-natural grasslands lead to biodiversity loss and declining ecosystem services and functions (Prangel et al., 2023). Grassland degradation caused by increases in livestock grazing threatens a variety of ecosystem services (Song et al., 2023). Estuaries are subject to disturbance by land-based sediment and nutrient inputs, resulting in ecosystem changes and the functions and services they support (Hillman et al., 2020). The global-scale degradation of coral reefs has reached a critical threshold, threatening ecological functionality and reef structure persistence (Toth et al. 2018).

In response to this urgent crisis of global land degradation, international strategies and frameworks have increasingly focused on the need for decisive counteractions. The urgency of these measures is underscored by a series of recent reports, including the " AR6 Synthesis Report: Climate Change 2023" by the IPCC (IPCC, 2023), which highlights the necessity for comprehensive actions across all sectors to effectively mitigate the effects of climate change and promote climate-resilient development. The report underscores the devastating consequences of every fraction of global warming, highlighting the critical need to keep global temperature rise as close to 1.5 degrees Celsius as possible to minimise catastrophic impacts (Akpan & Olanrewaju, 2023; Atkinson et al., 2021).

Land restoration is widely acknowledged as effective for reversing global land degradation (Schüler & Bustamante, 2022). Restoring degraded ecosystems is a global priority to mitigate climate change impacts and protect biodiversity (Gerrits et al., 2023). Restoration efforts not only help sequester carbon and improve ecological integrity but also contribute to conserving biodiversity and enhancing various ecosystem services crucial for human well-being. Restoring deforested and degraded landscapes can enhance habitat quality for various species, including mammals, birds, and other wildlife (Meerveld et al., 2021). Restored native forests have been shown to deliver a wide range of benefits, including carbon sequestration, biodiversity recovery, and livelihood improvements (Sacco et al., 2021). Additionally, forest regeneration and restoration efforts can positively impact local hydrological ecosystem

services, reducing the risk of erosion and flooding compared to degraded lands (Pashkevich et al., 2022). Also, restoring keystone species and foundation species, such as large wild herbivores, can play a vital role in maintaining plant diversity and ecosystem stability in tropical forests (Brudvig et al., 2021). The value of ecosystem restoration is further underscored by its potential advantages, improved soil health, and enhanced ecosystem services crucial for human well-being (Gerrits et al., 2023).To enhance the success of ecosystem restoration, it is vital to understand and address the impacts of land-use legacies on restoration outcomes. Restoration efforts aim to re-establish ecological succession and functionality disrupted or lost due to ecosystem degradation (Laughlin et al., 2017).

2.0 Global and regional initiatives for ecosystem restoration

Ecosystem restoration has garnered global attention due to its critical role in addressing the urgent crisis of global land degradation and its far-reaching implications for environmental sustainability. The restoration of degraded ecosystems has become a top priority on the international agenda, with numerous commitments and frameworks to promote biodiversity conservation and ecosystem resilience (Mappin et al., 2021). These initiatives emphasise the urgent need for active restoration efforts to conserve biodiversity, re-establish ecosystem functions, and address the impacts of climate change (Gerrits et al., 2023). These global commitments aim to restore significant portions of degraded ecosystems globally, recover ecosystem services, conserve biodiversity and promote sustainable development. It has emerged as a crucial strategy to address land degradation, focusing on mitigating threats like overexploitation, agricultural expansion, and urban sprawl. Due to the increasing recognition, International agreements and initiatives have emerged, setting ambitious goals for ecosystem restoration and emphasising its critical role in achieving environmental sustainability (Dhyani et al., 2022; Bayraktarov et al., 2020).

The urgency of ecosystem restoration is recognised in the longstanding commitments under the United Nations' Rio Conventions and in the more recent, ambitious initiatives designed to address the crisis at a global scale. The movement began with the Global Partnership on Forest and Landscape Restoration in 2003, which introduced a collaborative model for revitalising forests and landscapes worldwide; the momentum for restoration has steadily grown. This effort was bolstered by the launch of the Bonn Challenge in 2011, which set ambitious restoration targets. It was further reinforced by the New York Declaration on Forests in 2014, deepening the commitment to forest conservation and restoration across the globe.

Additionally, the United Nations Environment Programme (UNEP) prompted a call for action, urging countries to fulfil their commitments to restore 1 billion hectares of land and extend these efforts to marine and coastal areas (Fagan et al., 2020). This call to action highlights the need for restoration to address the alteration of ecosystem multifunctionality due to biodiversity loss and changes in functional composition. Furthermore, the importance of preserving and restoring mangrove forests to support biodiversity and ecosystem functioning has been highlighted, aligning with extending restoration commitments to marine and coastal areas.

The United Nations has reinforced this global movement by endorsing the 2030 Sustainable Development Goals (SDGs) and declaring 2021 to 2030 as the UN Decade on Ecosystem Restoration by the United Nations, which embodies a determined call to action, rallying global

efforts to revitalise degraded ecosystems (Gerrits et al., 2023). Jointly led by the Food and Agriculture Organization (FAO) and the United Nations Environment Programme (UNEP), this initiative represents a determined effort to foster a worldwide movement for ecosystem revival. The tangible outcomes anticipated from this Decade align closely with the SDGs, highlighting nature-based solutions for climate mitigation, water and food security, economic growth, and biodiversity conservation. This commitment to restoration sets paramount importance to establish specific targets and developments under key UN conventions such as the Convention on Biological Diversity (CBD), the United Nations Conventions to Combat Desertification (UNCCD) and the United Nations Framework Convention on Climate Change (UNFCCC) each playing a pivotal role in addressing these challenges.

2.1 CBD's Strategic Initiatives and Targets:

Before 2020, the CBD spearheaded several significant global biodiversity conservation and restoration initiatives. Among these was establishing the Aichi Targets for 2011-2020, a set of 20 ambitious goals aimed at halting biodiversity loss and promoting sustainable development. Notably, Target 15 set a specific restoration goal to rehabilitate at least 15% of degraded ecosystems by 2020. Despite significant global efforts, a mid-term review indicated that many countries were unlikely to meet all the Aichi targets by the deadline, underscoring the challenges of achieving such ambitious objectives (Farhadinia et al., 2022). Nevertheless, the Aichi Targets have served as a crucial framework for global biodiversity conservation, providing specific, time-bound objectives to guide international efforts in preserving biodiversity and ecosystem services. The CBD's emphasis on enhancing biodiversity in degraded ecosystems aligns with the primary goals of ecological restoration to improve biodiversity and ecosystem functioning (Guiden et al., 2021).

The post-2020 era marked a pivotal phase for the Convention on Biological Diversity, highlighted by adopting the Post-2020 Global Biodiversity Framework (GBF) at CBD COP 15 in December 2022. The Kunming- Montreal Global Biodiversity Framework aims to restore at least 30% of degraded ecosystems, demonstrating the CBD's commitment to large-scale ecosystem restoration (Wu,2023). This focus on restoring degraded ecosystems is consistent with the global "Bonn Challenge" initiative, which aims to reforest millions of hectares by 2030, highlighting the importance of active restoration in halting biodiversity loss and mitigating climate change (Pilon et al., 2023).

This comprehensive framework outlines an ambitious blueprint to guide global biodiversity efforts for the decade. It strongly emphasises ecosystem restoration as a crucial strategy for achieving the 2050 Vision of "Living in Harmony with Nature" (Mair et al., 2021).

2.2 UNCCD Strategic Initiatives and Targets:

Before 2020, the United Nations Convention to Combat Desertification (UNCCD) had significantly promoted sustainable land management and restoration as key strategies to combat land degradation. Recognised globally for advocating land degradation neutrality (LDN) by 2030, UNCCD emphasised stabilising or enhancing land resources to support ecosystem functions, enhance food security, and combat desertification. These targets focused on halting and reversing land degradation by maintaining and enhancing the health and productivity of land resources through balanced, sustainable land management practices and restoration efforts. The alignment of these goals with international commitments to large-scale ecosystem restoration, such as the Aichi Target 15 and the Bonn Challenge, underscores the comprehensive approach taken by UNCCD (Mappin et al., 2021).

Post 2020, the drive towards achieving LDN and broader ecosystem restoration objectives gained considerable momentum. Notably, new initiatives such as the Saudi and Middle East Green Initiatives, announced in March 2021, aimed to restore approximately 240 million hectares of degraded land across the region. These efforts reflect a strong commitment to combating desertification, enhancing biodiversity, and sequestering carbon emissions. Such ambitious actions align with global targets like the G20's goal to reduce degraded land by 50% by 2040, showcasing a significant shift towards land management on a global scale.

The post-2020 developments mark significant progress in the global endeavour to restore ecosystems and achieve LDN. The collaborative efforts underscored in these initiatives and discussions at UNCCD COP 15 reflect a collective understanding of the urgent need for action in ecosystem restoration. They emphasise the importance of an enabling environment, the mobilisation of resources, and the integration of nature-based solutions for achieving LDN and SDGs.

2.3 UNFCCC Strategic Initiatives and Targets:

Prior to 2020, the United Nations Framework Convention on Climate Change (UNFCCC) marked pivotal developments in integrating ecosystem restoration into global climate action strategies. A key initiative in this effort is the REDD+ initiative, which aims to reduce deforestation and forest degradation emissions, promote sustainable forest management, and enhance forest carbon stocks. Adopting the Paris Agreement, 2015 represented a landmark moment in global climate efforts, compelling nations to include ecosystem restoration in their Nationally Determined Contributions (NDCs). These NDCs underscore the essential role of

maintaining and enhancing the health of forests and other terrestrial ecosystems in meeting international climate goals.

Post 2020, the narrative of global climate action expanded significantly with the introduction of the Leaders' Pledge for Nature, announced in 2020. This initiative aligns with the objectives of the UNFCCC by integrating ecosystem resilience and biodiversity preservation within the climate mitigation and adaptation strategies, aiming for a reversal of biodiversity loss by 2030.

Furthermore, the proclamation of the UN Decade on Ecosystem Restoration (2021-2030) by the UN General Assembly, spearheaded by UNEP and FAO, emphasises massive scaling up of efforts to restore degraded landscapes. This declaration emphasises the need for effective measures to restore ecosystems and safeguard biodiversity (Villar et al., 2021). Moreover, ecological restoration is increasingly recognised as a political priority (Bucharovà et al., 2021).

This global initiative seeks to strengthen commitments to ecosystem health as a fundamental aspect of climate strategy. It aligns closely with the Paris Agreement's objectives and fosters a synergy between climate action and sustainable development.

2.4 Bonn Challenge Initiative:

Initiated in 2011 by the German government and the International Union for Conservation of Nature (IUCN), the Bonn Challenge has been a pivotal international effort in ecosystem restoration. It set an ambitious target of restoring 150 million hectares of land by 2020 and extending this goal to 350 million hectares by 2030 (Verdone et al., 2017). By 2017, this initiative surpassed its 2020 milestone, reflecting solid global participation and commitment.

Post 2020, the Bonn Challenge has continued to gain momentum with significant developments in its restoration targets. As of recent updates, more than 70 pledgers from over 60 countries are involved in restoring 210 million hectares of degraded and deforested lands. The recent inclusion of new pledges and the expansion of restoration commitments reflect the ongoing commitment to the initiative. For example, several countries in Eastern Europe and Central Asia have joined or expanded their pledges, contributing to restoring degraded lands and enhancing ecosystem services regionally and globally.

2.5 Regional Initiatives:

AFR100 (African Forest Landscape Restoration Initiative): This African-led initiative aims to restore 100 million hectares of African land by 2030, contributing significantly to the Bonn Challenge's goals. This initiative seeks to reverse ecosystem degradation, enhance

biodiversity, and promote sustainable African land management practices. The initiative has gained momentum, with several African countries stepping up their national restoration strategies and integrating them into broader economic and environmental policies. By restoring significant land areas, AFR100 contributes to international efforts to address environmental challenges and promote sustainable development in the region (Djiofack et al., 2024; Mugabowindekwe et al., 2022).

Post 2020, AFR100 has continued to progress, with countries like Ethiopia pledging to restore 15 million hectares of degraded landscapes as part of the initiative (Kassa et al., 2022). Additionally, the Regreening Africa Project, initiated by World Vision and CIFORICRAF, aims to scale efforts towards increasing forest cover and restoring degraded land in Kenya under the AFR100 and the Bonn Challenge (Odhiambo, 2024).

Initiative 20x20 in Latin America and the Caribbean: Launched in 2014, this initiative targets the restoration of 20 million hectares of land by 2020, with several countries in Latin America and the Caribbean participating. While the ambitious target was not fully met by 2020, significant progress has continued post 2020. Eighteen countries and three regional programs have now committed to restoring over 52 million hectares by 2030, with 8.2 million hectares of degraded land under restoration reported under this initiative.

ECCA30 (Europe, Caucasus, and Central Asia 30): Committed to restoring 30 million hectares of forest landscapes by 2030, ECCA 30 demonstrates the application of Forest Landscape Restoration (FLR) principles across diverse ecological, social, and economic contexts within these regions (Sewell et al., 2020). By engaging multiple stakeholders, including governments, non-governmental organisations, and local communities, ECCA30 seeks to implement large-scale restoration projects that contribute to sustainable development goals.

These initiatives support the Bonn Challenge's objectives and illustrate a strong regional commitment to landscape restoration, which is crucial for achieving global environmental targets related to climate change mitigation, biodiversity conservation, and sustainable development.

2.6 Multi-Actor Global Commitments

Building upon these foundational efforts, the ecosystem restoration movement has seen the emergence of additional influential initiatives.

The Trillion Trees Initiative:

This is a collaborative project of BirdLife International, Wildlife Conservation Society, and WWF, which aspires to protect and restore one trillion trees globally, leveraging the restorative power of forests to benefit people, nature, and the climate. The initiative has placed a growing emphasis on restoring high-impact ecological corridors. This approach maximises biodiversity conservation and enhances carbon sequestration, aligning restoration efforts with broader environmental and climate goals. There has been a deepening of partnerships with Indigenous communities, recognising them as crucial forest stewards. The Trillion Trees Initiative has shifted its focus towards the restoration quality and the long-term success of planted areas. This includes ensuring that tree planting activities are complemented by ongoing maintenance and protection measures to secure the restored areas against future degradation.

The Global Mangrove Alliance:

The Global Mangrove Alliance, launched in 2017, aims to expand the global area of mangrove habitats by 20% by 2030, addressing the critical need for coastal ecosystem restoration to combat climate change and enhance biodiversity. These initiatives and the Global Mangrove Watch, which supports the Alliance by providing essential data on mangrove ecosystems, means a significant expansion in the scope and scale of restoration efforts, underscoring the collective will to restore our planet's vital ecosystems for future generations. Surpassed the 20% target, but the focus has shifted towards ensuring thriving ecosystems. This initiative actively promotes innovative financing like blue bonds for long-term funding.

The Great Green Wall Initiative:

Launched in 2007 by the African Union, the Great Green Wall Initiative aims to combat desertification, enhance food security, and improve climate resilience across the Sahel region. Originally envisioned as a green belt of trees stretching from Senegal in the west to Djibouti in the east, the initiative focused on afforestation to restore 100 million hectares of currently degraded land. The goal was to sequester carbon and create green jobs in one of the world's poorest regions.

Since 2020, the GGW has undergone significant developments that have broadened its scope and deepened its impact. In 2021, during the One Planet Summit, the initiative was boosted significantly with the launch of the GGW Accelerator, which secured over $19 billion in pledges. These funds are aimed at fast-tracking the initiative's goals through improved collaboration and implementation strategies. This period also marked a strategic shift in focus from merely planting trees to prioritising the quality of restoration efforts. The initiative began to emphasise sustainable, long-term environmental, social, and economic benefits, integrating

community engagement and indigenous knowledge to ensure that restoration practices are culturally appropriate and locally supported. Additionally, the GGW has expanded its approach to encompass comprehensive ecosystem restoration, fostering stronger partnerships with international agencies, governments, and non-governmental organisations to enhance its reach and efficacy across the Sahel region. These post-2020 developments have significantly shaped the GGW, highlighting a holistic and inclusive approach to restoring one of the world's most vulnerable regions.

The Middle East Green Initiative:

The Middle East Green Initiative, launched in 2022, was led by Saudi Arabia to mitigate the impact of climate change on the region and collaborate to meet global climate targets. Increasing regional cooperation and creating the infrastructure needed to reduce emissions and protect the environment aims to amplify its impact in the global efforts against climate change while creating significant economic opportunities for the region. This initiative includes ambitious targets such as reducing carbon emissions by 670 million tons and planting 50 billion trees to restore 200 million hectares of degraded land. To accelerate the implementation of these goals, Saudi Arabia allocated 2.5 billion US dollars to support projects and governance.

3.0 Gaps in Ecosystem Restoration Pledges and Achievements

The difficulties faced in restoring degraded ecosystems are evident in the challenges in fulfilling global ecosystem restoration commitments and pledges. Global commitments and pledges target almost a billion hectares, emphasising the global priority for forest restoration (Sewell et al., 2021). However, meeting restoration targets may necessitate active strategies to accelerate natural regeneration rates and overcome the resilience associated with degraded ecosystem states. While there is a growing recognition of the importance of ecosystem restoration in achieving environmental goals, the actual progress in fulfilling restoration pledges remains limited.

3.1 Resource Allocation:

Nature-negative finance:

The state of finance for Nature 2023 report highlights a significant imbalance in financing, with a substantial portion of funds directed towards activities detrimental to ecosystems, overshadowing financial support for NBS (UNEP, 2023). The report notes that nature-negative activities receive approximately $7 trillion, surpassing the $200 billion allocated to NbS. As restoration is one of the core parts of the NbS, this imbalance in resource allocation poses a challenge to achieving restoration pledges and commitments (Cerullo,2024).

To address the gaps in resource allocation for restoration pledges and commitments, it is essential to prioritise nature-based solutions and sustainable ecosystem management practices. Initiatives that enhance biodiversity, promote forest restoration, and mitigate the impacts of land-use legacies can contribute to more effective restoration efforts (Cerullo, 2024; Bentley et al., 2020; Brudvig et al., 2021). By redirecting financial resources towards NbS and sustainable restoration practices, countries and organisations can work towards fulfilling restoration commitments and promoting long-term environmental sustainability.

Insufficient and Inconsistent funding:

Insufficient funding remains critical, with the public and private sectors failing to provide adequate financial flows for the ecosystem restoration commitments. Despite increasing interest in restoration efforts, insufficient and unstable funding hinders progress in achieving restoration commitments, ultimately impacting efforts to promote sustainable ecosystem management and conservation (Galatowitsch.,2022; Lengefeld et al., 2022; Bateman et al., 2015). This issue is further compounded by diminishing government funding for conservation

and restoration projects, leading to a greater reliance on private investment and community groups (Collard et al., 2019).

Sectoral Misalignment:

The misalignment in funding (ex., agriculture) undermines initiatives directed towards sustainable practices and restoration efforts. The imbalance in resource allocation can hinder progress in achieving restoration goals and commitments, ultimately impacting efforts for restoration. The relationship between financial support and ecosystem degradation underscores the need for a shift towards prioritising nature-based solutions and sustainable practices to ensure effective restoration and conservation efforts (UNEP, 2023; Wineland et al., 2023).

3.2 Institutional Coordination

Public and Private Misalignment:

Misalignment between public policies and private sector practices leads to contradictory actions that hinder the effective allocation of resources to restoration initiatives (UNCCD, 2022). Efforts to combat climate change and promote sustainability require aligning public and private sector actions. As a significant contributor to environmental challenges, the private sector has the potential to drive innovation and decarbonisation efforts with the support of public policies (Rodriguez-Jasso et al., 2020).

Sectoral Disparities:

Efficient and coordinated strategies are essential for successful ecosystem restoration efforts, especially when aiming to fulfil international commitments such as those outlined in the UN Decade on Ecosystem Restoration. However, coordinated strategies across critical sectors such as agriculture, forestry, and fisheries are often lacking, leading to inefficient and sometimes conflicting actions (UNEP, 2023). To address these challenges, it is crucial to involve all stakeholders, including smallholder farmers, and implement cost-effective natural resource management practices that provide economic benefits to communities (Chia et al., 2022).

Insufficient Integration:

Environmental policies frequently lack integration with other developmental goals, leading to fragmented strategies that limit the effectiveness of resource allocation for restoration

activities (UNEP,2023; Hedlund et al., 2022). Integrating environmental issues into sectorial policies, as emphasised by Environmental Policy Integration, is fundamental for achieving any sustainable development goals (Mateo-Tomàs et al., 2018). Addressing the challenges of insufficient integration in environmental policies requires a holistic approach considering the interdependencies between ecosystem restoration and development goals.

3.3 Data Availability

Lack of Granularity:

A persistent obstacle in ecosystem restoration efforts is the significant lack of detailed data within restoration projects, such as allocating and utilising funds, project area, intervention types, etc. This deficiency in granular data hampers the ability to conduct thorough evaluations of restoration initiatives (Stapanian et al., 2016). This is mainly due to limited funding, logistical constraints, and the typically short timeframes allocated to restoration projects, which collectively contribute to restricted project scopes and potentially compromise their long-term viability (UNEP, 2023). Secondly, the lack of detailed financial and impact data prevents stakeholders from making informed decisions and optimising the allocation of resources for future projects.

Lack of Transparency:

Transparency in data sharing is crucial for ensuring the success and legitimacy of restoration projects (Pape, 2020). The lack of transparency in reporting restoration progress can lead to discrepancies and hinder the accurate assessment of the success or failure of restoration initiatives (Shukla et al., 2022). Several studies highlight the complexity and challenges faced in restoration projects, emphasising the need for improved financial transparency and evaluation mechanisms (Shaver et al., 2022; Faulkner et al., 2011). Additionally, the transparency of ecosystem and economic models is essential for stakeholders to understand the strengths and limitations of restoration strategies, thereby fostering informed decision-making. Overcoming these challenges requires a concerted effort to promote data sharing, openness and transparency in restoration projects to ensure practical monitoring, evaluation, and reporting of restoration outcomes.

3.4 Monitoring and Reporting

Inconsistent Reporting Standards:

Inconsistent reporting standards pose a significant challenge in evaluating global efforts related to financial flows and restoration progress. The lack of consistent reporting frameworks complicates accurately assessing restoration initiatives and financial allocations (UNCCD 2022). This inconsistency hampers the ability to effectively monitor and evaluate the impact of global restoration and conservation efforts. Moreover, transparency issues further exacerbate the challenges in monitoring and reporting on restoration initiatives by hindering accountability and the ability to track the effectiveness of restoration efforts. (UNEP 2023; Geijzendorffer et al., 2017).

Comprehensive Monitoring:

Significant gaps exist in comprehensive monitoring mechanisms, which are crucial for evaluating the effectiveness of restoration efforts at both national and international levels (UNCCD, 2022). These gaps lead to challenges in tracking progress and evaluating restoration initiatives' success due to data granularity issues and transparency about financial flows and project impacts (Mason et al., 2023; Österblom et al., 2016). The lack of detailed data and transparency poses obstacles to assessing the impact of restoration projects and allocating resources effectively

4. Opportunities for Ecosystem Restoration Commitments

4.1 Financial Realignment:

Ecosystem restoration provides a significant opportunity for necessitating the realignment of financial incentives and the development of new mechanisms to support restoration efforts. Redirecting financial flows from the nature-negative activities to NbS, aligning with Rio Convention targets and broader sustainability goals to significantly increase funding for ecosystem restoration. (UNEP, 2023). Studies highlight the importance of investing in ecosystem restoration to promote biodiversity and ecological efficiency, which can yield long-term benefits and returns on financial investment (Groot et al., 2013). Furthermore, financial mechanisms like payments for ecosystem services and carbon offset mechanisms are crucial in supporting ecosystem restoration efforts.

Private Sector Engagement:

Private sector investment is essential for managing ecological infrastructure and integrating the costs of ecosystem services into sectors that directly benefit from these services, such as water and infrastructure developments (Cumming et al., 2017). The engagement of private companies, including mining and utility firms, is crucial for mainstreaming ecosystem restoration as a business endeavour (Groot et al., 2013). Financial incentives play a pivotal role in promoting biodiversity, particularly for rare and threatened species, underscoring the importance of developing new financial mechanisms to support ecosystem restoration efforts (Bartholomew et al., 2022). Leveraging new sources of capital from the private sector and realigning financial incentives, such as subsidies and payments for ecosystem services, are essential strategies to scale up tropical restoration efforts and achieve environmental benefits and socially equitable outcomes (Edwards et al., 2021).

4.2 Policy Harmonisation and International Cooperation

Policy Harmonisation:

Policy harmonisation for ecosystem restoration involves aligning various policies to support and facilitate restoration efforts. This can be achieved by integrating ecosystem accounting to develop risk registers for specific ecosystems, such as peatlands, to inform restoration targets at a catchment scale (Farrell et al., 2022). Policy design focused on livelihood security can synergise ecosystem restoration with local economic development, creating opportunities for

sustainable restoration practices (Lengefeld et al., 2022). Institutional redesign is crucial to empower advances in restoration ecology and rewilding, enabling the effective implementation of restoration policies and practices (Jepson,2022). Policy harmonisation can optimise ecosystem restoration to achieve sustainable and impactful restoration outcomes by incorporating these diverse perspectives and approaches.

International Cooperation:

International Cooperation is crucial for advancing ecosystem restoration efforts. By leveraging international principles, standards and collective frameworks, restoration practitioners can work together to restore ecosystems, mitigate climate change, and enhance the resilience of ecosystems worldwide. The UN Decade on Ecosystem Restoration offers a significant opportunity for global collaboration among restoration practitioners (Ficher et al., 2021). Adhering to international principles and standards for ecological restoration enables practitioners to collectively address the decline of ecosystem services and biodiversity worldwide (Gann et al., 2019). By fostering partnerships and cooperation at an international level, restoration initiatives can benefit from diverse perspectives, resources and expertise to enhance the success and impact of restoration projects (Carter et al., 2015).

4.3 Reporting Frameworks and Data Transparency

Standardisation of Reporting Frameworks:

Standardisation of reporting frameworks for ecosystem restoration is crucial for effectively monitoring and evaluating ecosystem restoration efforts. Studies emphasise the importance of standardised frameworks in evaluating restoration initiatives' costs, benefits, and progress across various ecosystems (Eger et al., 2022 & Bodin et al., 2021). Moreover, integrating ecosystem accounting into restoration projects can assist in developing risk registers and setting restoration targets at a catchment scale, underscoring the role of standardised approaches in restoration planning (Farrell et al., 2022). Additionally, indicator-based monitoring frameworks are necessary to quantify restoration potential, effect, and outcome, emphasising the importance of standard indicators in evaluating restoration success (Johansen et al., 2024).

Data Availability and Transparency:

Improving the granularity and transparency of financial flow, restoration interventions and impacts is crucial for achieving ecosystem restoration commitments. Various studies

emphasise the importance of data availability and accessibility in supporting ecosystem restoration efforts. Ssocio-economic data, for instance, is crucial to measuring the ecosystem services that can drive international commitments to large-scale restoration (Groot et al., 2013). Keeler et al. (2019) demonstrate how integrating biophysical and social data into spatial ecosystem services metrics can enhance the benefits of conservation activities. Similarly, Farrell et al. (2022) used ecosystem accounting to develop a peatland risk register, highlighting the importance of transparent decision-making based on relevant information. McCormick et al. (2021) emphasise the need for science-based restoration actions to improve restoration success rates, indicating the pivotal role of technology in guiding restoration practices. Thus, adopting citizen science, machine learning, and monitoring tools can significantly enhance data collection and reporting capabilities for ecosystem restoration commitments. As shown in Table 4.1, Comprehensive Overview of Global Ecosystem Restoration Efforts: Key Initiatives, Gaps, and Opportunities, significant gaps remain in restoration funding across regions.

Comprehensive Overview of Global Ecosystem Restoration Efforts: Key Initiatives, Gaps, and Opportunities

Table 4.1 Overview of Global Ecosystem Restoration efforts, gaps and initiatives

Section	Subsection	Key Themes and Initiatives	Description and Key Points
1. Introduction		Global Land Degradation	This paper highlights the critical state of ecosystems due to climate change and human activities and their impact on biodiversity and human well-being. It cites various studies indicating the severe implications of ecosystem degradation.
2. Global and Regional Initiatives		Importance of Ecosystem Restoration	Discusses the global urgency, initiatives like the Bonn Challenge, the UN Decade on Ecosystem Restoration, and specific actions by UNEP—

			Emphasises alignment with the Sustainable Development Goals.
	2.1 CBD Initiatives	Strategic Initiatives and Targets before and post-2020	Covers the Aichi Targets and the Post-2020 Global Biodiversity Framework, focusing on large-scale ecosystem restoration goals.
	2.2 UNCCD Initiatives	Strategic Initiatives and Targets	Describes efforts towards achieving Land Degradation Neutrality (LDN), including new initiatives like the Saudi and Middle East Green Initiatives.
	2.3 UNFCCC Initiatives	Strategic Initiatives and Targets	Details the integration of ecosystem restoration in climate action through REDD+, NDCs, and the Leaders' Pledge for Nature.
	2.4 Bonn Challenge Initiative	Progress and developments post-2020	Updates on restoration targets, including increased global commitments and regional engagement in restoration efforts.
	2.5 Regional Initiatives	Specific regional initiatives like AFR100 and Initiative 20x20	Outlines contributions to restoration from different regions and how these support broader global restoration goals.
3. Gaps in Restoration	3.1 Resource Allocation	Nature-negative finance, Insufficient and inconsistent funding	It discusses significant gaps, such as insufficient funding and the dominance of nature-negative finance. It highlights the need for better financial alignment for restoration.

	3.2 Institutional Coordination	Public and private misalignment, Sectoral disparities	Emphasises challenges in aligning public policies with private sector practices and the lack of coordinated strategies across sectors.
	3.3 Data Availability	Lack of granularity, Lack of transparency	Points out the deficiencies in granular data and transparency that hamper monitoring and evaluating restoration initiatives.
	3.4 Monitoring and Reporting	Inconsistent reporting standards, Comprehensive monitoring	Highlights inconsistencies in reporting standards and the need for comprehensive monitoring mechanisms.
4. Opportunities for Restoration	4.1 Financial Realignment	Redirecting financial flows, Private sector engagement	Suggests realigning financial flows to support restoration and engaging the private sector to leverage investments in ecosystem services.
	4.2 Policy Harmonization and International Cooperation	Harmonising policies, Enhancing international cooperation	Advocates for harmonising restoration policies across different sectors and enhancing international cooperation to bolster global restoration efforts.
	4.3 Reporting Frameworks and Data Transparency	Standardisation of reporting frameworks, Improving data transparency	Stresses the importance of standardising reporting frameworks and enhancing data transparency to support effective restoration monitoring and evaluation.

5. Database methodology

5.1 Introduction

Developing our global and regional restoration commitments database methodology largely follows the established method by Sewell et al. (2020), "Technical Note on Methodology for the Global Restoration Commitments Database". The foundational framework and key processes have been adopted with minimal modifications to ensure consistency and comparability with the previous dataset. This methodology provides a robust foundation for collecting and categorising data across different restoration commitments under various international processes. It has been recognised for its comprehensive approach to addressing the complexities associated with multi-scale restoration efforts.

By adopting this methodology, we can leverage a tried-and-tested framework that enhances the consistency and reliability of our data collection processes. This not only ensures that our efforts are aligned with internationally recognised standards, facilitating comparability and interoperability with other global restoration datasets, but it also underscores our audience's crucial role in this process. Their involvement is a process. Following this established method, we can effectively track and analyse restoration commitments under the Rio Conventions and other initiatives. This provides a clear and accurate global overview crucial for informed decision-making and strategic planning in ecosystem restoration.

Our approach justifies reliance on a methodology already vetted and applied successfully in the field and streamlines our research process. This efficiency allows us to focus on refining secondary data collection and enhancing the database's utility while benefiting from the foundational research that has set a high standard for accuracy and comprehensiveness in environmental data reporting.

5.2 Commitments Included in the Database

The Global Restoration Commitments Database comprehensively records international and regional restoration commitments from key global conventions and initiatives. This section details these commitments, which are crucial to global and regional ecosystem restoration strategies.

- **Convention on Biological Diversity (CBD)**: The database records commitments stemming from the CBD, particularly those linked to the Aichi Biodiversity Targets and the

Post-2020 Global Biodiversity Framework, which focus on restoring ecological integrity globally.

- **UN Framework Convention on Climate Change (UNFCCC)** includes reforestation and afforestation commitments, primarily under the REDD+ initiative and Nationally Determined Contributions (NDCs), to enhance carbon sequestration and address climate change.

- **UN Convention to Combat Desertification (UNCCD)**: The database features national commitments from Land Degradation Neutrality (LDN) Target Setting reports, focusing on reversing land degradation. Additionally, it incorporates commitments from the Great Green Wall Initiative, which aims to restore 100 million hectares of currently degraded land across the Sahel region. This ambitious project supports the UNCCD's LDN targets by directly contributing to land restoration efforts, enhancing biodiversity, and improving livelihoods through sustainable land management practices.

- **Bonn Challenge**: Documents ambitious targets for restoring deforested and degraded lands, with specific national restoration commitments. A key notable aspect of the Bonn challenge is its emphasis on fostering regional cooperation. Key regional initiatives supporting this global effort include AFR100 in Africa, Initiative 20x20 in Latin America and the Caribbean, and ECCA30 in Europe, the Caucasus, and Central Asia. As the Bonn Challenge database includes all these initiatives' commitments, the regional commitments database only verifies the Bonn Challenge database.

5.3 Conditions for Inclusion of Commitments in the Updated Database

The criteria for including commitments in the Global Restoration Commitments database are based on the standards set by Sewell et al. (2020), focusing on publicly available, quantifiable commitments expressed in hectares or convertible metrics. The previous Global Restoration Commitments database is a comprehensive database documenting international and regional pledges for ecosystem restoration. The methodology outlined the reports on the conditions used for preparing the database. By retaining these original criteria, we ensure consistency and continuity in data collection, inclusion, and verification processes. This is mainly to provide comparability over time and maintain the usability of the existing database for policymakers, researchers, and other stakeholders. Conditions for the inclusion of country commitments are described below.

1.   **Public availability and source verification:**
     Commitments must originate from publicly available, accessible, and officially published national plans or reports. The country should issue these documents through recognised conventions, the Bonn Challenge, other international processes, or

affiliated regional initiatives. If additional national commitments are mentioned in other national documents (e.g., national forestry plans).

2. **Restoration and rehabilitation focus:**

Commitments must specifically address restoration or rehabilitation activities. This ensures a clear focus on actions aimed at restoring or improving degraded ecosystems.

3. **Quantitative and Measurable Commitments:**

Commitments must be quantitatively defined, providing measurable targets expressed in hectares or equivalent area-based metrics.

4. **Translatable Area Metrics:**

Commitments should be translatable into hectares if they include a reference year. For instance, a pledge to "increase forest cover by 20% by 2030 compared to 2015" can be converted into hectares using FAO's 2015 forest area data as the baseline.

5. **Protected area commitments:**

Commitments referring to protected areas must include specific hectare metrics. Commitments stated in percentage change from a baseline year are excluded due to current time constraints but may be added later using resources such as World Database on Protected Areas (WDPA).

6. **Reference Year and Avoidance of Overlap:**

Commitments must indicate an increase in hectares from a clear reference year rather than merely stating total amounts by future data without a starting point. This approach helps prevent overlaps with already completed commitments.

5.4 Data Categorisation Per Country

To ensure the precise inclusion of commitments in the database and follow the methodology developed by Sewell et al. (2020), the exact text of each commitment is transferred verbatim into the database. When a sentence contains multiple commitments, each is separated into individual cells. Qualitative commitments that are merely descriptive and do not specify restoration measures are excluded. Suppose the source document is unavailable in English. In that case, the original text is copied, and a translated version (via Google Translate) is attached as a comment to the cell with the original text.

This section outlines the rules for categorising extracted data. The database is maintained in Microsoft Excel, with each country allocated a specific row and columns dedicated to various data entries. Column headings represent the type of data captured.

- **Region/IMAGE regions:**

The previous report used the Global Land Outlook Scenario analysis to categorise countries. The country column can also be used to derive other geographic groupings. We keep the same structure for the region's classification.

- **Country:**

This column includes the name of the country and its corresponding region based on the ten regions defined by Sewell et al. (2020).

- **Commitment Type:**

This column specifies the data source, such as Land Degradation Neutrality (LDN), Nationally Determined Contributions (NDC), National Biodiversity Strategies and Action Plans(NBSAP) and or Bonn Challenge.

- **Commitment/ Target**

The commitment text is copied directly into the database. If necessary, translations are added as comments attached to the cell containing the original text.

- **Quantitative? (Y or N)**

This column indicates whether the commitment is quantitative. It is marked with a "Y" for yes or an "N" for no.

- **Unit**

This column specifies the unit in which the commitment is measured. By adhering to these guidelines, the database ensures clarity, accuracy, and utility for analysing global restoration commitments. Table 5.1, Overview of Units in Which Commitments Are Expressed in the Database, provides a breakdown of the various units used across different commitments, highlighting the diversity in measurement standards.

Table 5.1 Overview of units in which commitments are expressed in the database.

Unit	Unit in full	Comment
Ha	Hectares	
%	Percentage or percentage change	Where commitment in % change is expressed with a reference year and can be converted into hectares using FAO data, change the unit to Ha
t/ha	Metric tonnes per hectare	
tCO2	Metric tonnes CO2	
GgCO2	Gigagrams CO2	
tCO2-eq	Metric tonnes of CO2 equivalent	
Other		Where commitment is expressed in a unit not included above, such as `3 watersheds' or `4 communities.'
Multiple		Combination of units e.g. ha and t/ha

- **Restoration Category and Subcategories**

The previous restoration category established by Sewell et al. (2020) has been used as the primary typology for the categories. However, integrating the IUCN's Restoration Intervention Typology for Terrestrial Ecosystems (Annexe: Table 1) has significantly enhanced the categorisation of restoration commitments. This detailed typology includes a wide range of intervention types tailored to various ecosystems, allowing for the inclusion of new country commitments that did not align with the categories previously used by Sewell et al. This comprehensive framework ensures that all restoration activities are captured accurately. However, like the previous report, many commitments encompass multiple restoration categories within a single commitment, as shown in Table 5.2. These are classified under multiple categories to maintain consistency with the previous classification while

accommodating the broader scope of interventions now included. This approach enriches the database and provides a more holistic view of global restoration efforts, ensuring that nuanced and complex restoration activities are appropriately categorised and tracked.

Table 5.2 Existing database categorisation of restoration measures.

Group	Restoration Measures	Overarching Type
Restore/improve forest land	- Reduce/halt deforestation and conversion of forest to other land cover types (includes conserving forest land)	Restoration & Protection
	- Restore forest land	Restoration & Protection
	- Increase land productivity in forest areas	Management & Rehabilitation
	- Improve forest management e.g. wildfire management	Management & Rehabilitation
Increase forest land	- Increase forest land (net gain) e.g. plantations	Restoration & Protection
Restore/improve cropland	- Increase land productivity in agricultural areas	Management & Rehabilitation
	- Rehabilitate bare or degraded land for crop production	Management & Rehabilitation
	- Improve water use for irrigation	Management & Rehabilitation
	- Halt/reduce the conversion of cropland to other land cover types	Restoration & Protection
	- Sustainable Land Management	Management & Rehabilitation
Restore/improve grassland and savannah	- Restore and improve pastures	Management & Rehabilitation
	- Improve land productivity in grassland/savannah	Management & Rehabilitation

	- Restore rangeland (e.g. by controlling livestock and wildfires)	Management & Rehabilitation
	- Halt/reduce conversion of grassland to other land cover types	Restoration & Protection
Restore/improve wetlands	- Halt/reduce wetland conversion to other land uses (includes conserving wetlands)	Restoration & Protection
(including peatlands and mangroves)	- Restore/preserve wetlands and reduce degradation of wetlands	Restoration & Protection
Increase soil fertility and carbon stock	- Rehabilitate bare land and/or restore degraded land	Management & Rehabilitation
	- Increase carbon stock and reduce soil/land degradation	Management & Rehabilitation
	- Maintain current level of SOC	Management & Rehabilitation
	- Reduce soil erosion	Management & Rehabilitation
	- Reduce sand encroachment	Management & Rehabilitation
	- Improve watershed/landscape management	Management & Rehabilitation
Manage artificial area and mining	- Restore degraded mining areas	Restoration & Protection
	- Halt illegal mining and/or reduce mining area	Restoration & Protection
	- Improve land productivity in artificial areas	Management & Rehabilitation
	- Halt/reduce/regulate expansion of urban/artificial area	Restoration & Protection

Restore/improve protected areas	- Restore protected areas	Restoration & Protection
	- Improve management of protected areas	Restoration & Protection
Increase protected areas	- Increase protected areas	Restoration & Protection
Improve coastal management	- Reduce coastal erosion	Restoration & Protection
	- Reduce saline water intrusion in coastal zone	Management & Rehabilitation
Other/General/Unspecified	- Avoid/Prevent/halt degradation (of degraded lands)	Restoration & Protection
	- Restore vegetation cover (unspecified land use)	Restoration & Protection
	- Achieve LDN	Management & Rehabilitation
	- Improve land productivity (unspecified land use)	Management & Rehabilitation
	- Other/General/Unspecified	Management & Rehabilitation
Instrument	- General instrument (e.g. policies, economic incentives)	Restoration & Protection
Restore/improve multiple land use	- Forest and grassland	Management & Rehabilitation
	- Cropland and grassland	Management & Rehabilitation
	- Forest and wetlands	Restoration & Protection
	- Forest, cropland and grassland	Management & Rehabilitation
	- Protected area and forest	Restoration & Protection
	- Other	Management & Rehabilitation
	- All land uses	Management & Rehabilitation
Reduce/halt conversion of multiple land uses	- As above	Restoration & Protection

Restore/improve multiple functions	- Productivity and carbon stock	Management & Rehabilitation
	- Other	Management & Rehabilitation
	- Multiple functions	Management & Rehabilitation
Restore/improve multiple functions in multiple land uses	- Improve productivity and SOC stock in croplands and grasslands	Management & Rehabilitation
	- Other	Management & Rehabilitation

- **Land use category**

The current method retains the same land use categories outlined in Sewell et al. (2020) to link the two reports. As shown in Table 5.3, Land use categories used in the database, desert and mountain ecosystems, were excluded because they were rarely referenced in quantitative commitments. This consistency in land use categorisation ensures seamless integration with past data while enhancing the accuracy and relevance of the restoration measures linked to different land use scenarios.

Table 5.3 Land use categories used in the database

Land use categories	Includes
Forest	Forest plantation
Grassland	Savannah, Rangeland, Pasture, Silvopasture
Wetlands	Mangroves, Peatlands
Cropland	Agricultural land, agroforestry
Coastal	
Protected Areas	Conservation areas
Bare land	
Artificial/ urban areas	Mining
Other/ not specified	
Multiple	
Freshwater systems	Watersheds
Natural ecosystems	

- **Primary function/goal**

For consistency and clarity, the database categorisation of restoration measures follows the same primary function/goal methodology outlined in Sewell et al.'s report. This approach ensures that the primary objective of each restoration effort is identified based on the details provided in national plans (refer to Table 5.4).

In the context of LDN reports, restoration goals are often specified as carbon sequestration, water retention, soil fertility enhancement, land productivity improvement, and biodiversity conservation. Similarly, NBSAPs frequently mention goals for enhancing ecosystem services and increasing resilience to climate change. Although NDC might reference additional goals such as improving governance, boosting incomes, reducing conflicts, and curbing youth exodus, these objectives are not prevalent enough to justify their categories. They are, therefore, classified under "other."

A commitment's primary function is only categorised if it is explicitly stated or can be inferred from the text. This method ensures a precise and functional categorisation that aligns with the structured approach used in previous methodologies. This continuity allows for effective comparison and integration with past data, enhancing the robustness of scenario analyses and ensuring comprehensive documentation of global restoration efforts.

Table 5.4 Overview of the goal categories of restoration commitments

Primary function categories
Carbon
Water
Soil fertility
Productivity
Biodiversity
Other
Multiple
Resilience to climate change
Enhance ecosystem services

- **Total Amount of Hectares**

The total number of hectares is calculated individually for each subcategory, aggregating all relevant commitments for each country. Forest changes in percentage terms from a baseline

year are converted into hectares using FAO data, with 2015 as the reference year following the methodology established by Sewell et al. (2020).

- **Reference Year**

This column records the reference year as per the existing methodology.

- **Deadline Year**

This column specifies the year by which the commitment is to be fulfilled. If no deadline is mentioned, commitments related to the NBSAPs are assumed to be 2030 or 2020.

- **Link to Other Plans**

This section follows the methodology established by Sewell et al. (2020) to maintain the synergies between various commitments. In line with this approach, reports are scanned for terms related to other Rio Conventions and national plans, with findings preliminarily scored as detailed in Table 5.5. While this information is currently not fully integrated into our database due to its incomplete nature, it follows the foundational methodology. It could be fully incorporated into future database expansions, continuing the practices established by Sewell et al. (2020).

Table 5.5 Scoring used in the database of links to other plans mentioned in national plans

Link to other plans	Explanation
No	Not mentioned at all.
Mentioned	Mentioned in name, e.g. this country has ratified this convention
Efforts to align	The report mentions efforts to align or find synergies between different reports, plans and commitments.
Clear alignment	The report mentions clear alignment with other reports, plans, commitments and targets. For example, "these targets contribute to the NDC and Bonn Challenge targets, which are x and x"

- **Source Link**

This column contains the precise online URL for each data source associated with the commitments, ensuring easy access and verification of the information. Table 5.6 shows the online location of the data sources.

Table 5.6 Links to Data Sources

Name of the source	Link
UNCCD - LDN Voluntary targets	https://www.unccd.int/our-work/country-profiles/voluntary-ldn-targets
UNCCD – LDN country profiles	https://www.unccd.int/our-work/country-profiles
CBD NBSAPs and national targets	https://www.cbd.int/nbsap/targets/default.shtml
UNFCCC NDC reports	https://unfccc.int/NDCREG
Bonn Challenge	https://www.bonnchallenge.org/

5.5 Uncertainties

Given the expansive scope of the database and time constraints, certain uncertainties regarding data extraction, categorisation, and the calculation of hectares must be acknowledged. To address these issues, random checks were conducted to verify the data extraction and categorisation processes.

5.5.1 Data Extraction

Despite efforts to maintain consistency in data extraction, some inconsistencies and inaccuracies may persist. This variability is primarily attributed from different data sources' diverse reporting styles and structures. For instance, NBSAPs differ significantly between countries in format, style, and length. They often lack a clear summary of commitments, which are unevenly distributed throughout the reports, in some cases making them difficult to identify. While attempts were made to capture all relevant commitments, some may have been overlooked due to human error or translation inaccuracies.

Additionally, the broad definition of ecosystem restoration means that some topics with indirect links to restoration, such as invasive species and pollution, were not included in the database. These topics represent potential areas for future database expansion.

Efforts were made to include as many relevant commitments as possible, but some may have been missed due to the challenges. Ensuring accuracy in translation and data interpretation is crucial for minimising these uncertainties.

5.5.2 Categorisation

The categorisation of commitments within the database undergoes rigorous cross-validation to maintain consistency. Despite thorough sampling and verification, discrepancies may persist due to the variable interpretations of restoration definitions and the diversity in reporting styles. Initially, the framework primarily utilised the UNCCD's LDN targets; however, it proved inadequate for comprehensive application across diverse data sources, prompting an expansion to incorporate broader categories. This adaptation helped address misalignments, such as specific NBSAP commitments not aligning with LDN criteria, necessitating the introduction of new categories like "increase protected areas" to reflect measures preventing land degradation more accurately.

Challenges remain in categorising mixed commitments that span multiple land use or restoration categories, often lacking precise quantitative specifics tied to specific restoration measures. Moreover, categorising commitments from the Bonn Challenge and related regional initiatives introduces its challenges, as highlighted by Sewell et al. (2020). The Bonn Challenge website typically lists total commitments to Forest Landscape Restoration (FLR) without detailed category breakdowns, leading to a generic classification under 'restore/improve forests' until more detailed data becomes available.

5.5.3 Incorporating Diverse Restoration Commitments

Not every restoration commitment quantified in the database is expressed in terms of hectares. Some commitments use different land units, such as square kilometres or feddan, which have been converted to hectares for consistency in the database. This database does not include commitments quantified in non-land metrics, such as metric tons of CO_2 or counts of ecological features like watersheds.

Furthermore, it is crucial to differentiate between commitments that expand restored or protected areas and those that merely acknowledge existing initiatives. For instance, a commitment might declare plans to enhance ecological resilience in 500,000 hectares of national parks without specifying if this represents new restoration efforts or ongoing projects. In such cases, only the additional new hectares under restoration are recorded to ensure accurate progress tracking without double-counting areas already accounted for.

5.6 Coherence Between Different Commitments

The recent analysis unveils a series of gaps in the alignment of restoration commitments that reflect ongoing challenges in synchronising global restoration efforts. Building upon the foundational insights from Sewell et al. (2020), this section delves into the coherence and overlap of the updated quantitative restoration commitments documented in the current database and compares them with previous findings.

- **Alignment of Commitments**:

A previous report by Sewell et al. (2020) noted significant discrepancies in alignment, particularly between the contributions under the UNFCCC and national targets aligned with the Aichi Biodiversity Targets. The findings reiterate these gaps, highlighting a persistent lack of synergy between commitments made under various international frameworks such as the Rio Conventions and the Sustainable Development Goals (SDGs). This misalignment underscores the need for enhanced coordination and integration of policy frameworks and restoration goals.

- **Inconsistencies in Sectoral Commitments**:

CBD & FERI (2016) identified inconsistencies in how ecosystem-based contributions under the UNFCCC aligned with specific Aichi Biodiversity Targets, notably Targets 5 and 15. The recent analysis confirms that these inconsistencies remain unaddressed, affecting restoration efforts' effectiveness and capacity to comprehensively meet biodiversity and climate objectives.

- **Coordination Challenges**:

As Mansourian (2017) and Chazdon et al. (2017) noted, implementing large-scale restoration projects remains challenging due to complex coordination demands between governments and donors. This is compounded by insufficient integration and communication within and between relevant ministries and sectors, as highlighted in previous and current analyses. As Gichuki et al. (2019) suggested, effective coordination within or between ministries is crucial for aligning different commitments and ensuring a coherent restoration strategy.

- **Sectoral and Ministry Integration**:

Chazdon et al. (2021) emphasised the essential role of effective management and coordination across various sectors or ministries to bridge gaps in restoration commitments.

This observation remains relevant, as the new data reveals ongoing challenges in integrating restoration efforts across different governmental and environmental sectors. Such integration is pivotal to overcoming the fragmentation in restoration initiatives and achieving cohesive implementation that supports broader environmental and sustainability goals.

5.6.1 Methodology for Estimating Coherence and Overlap Between Commitments

Step 1: Limiting Overlap Within the Bonn Challenge and Associated Initiatives To minimise overlap within the Bonn Challenge and its regional initiatives, the highest single-country commitment is used. For instance, if a country has 1 million hectares committed under the Bonn Challenge and 1.2 million hectares under AFR100, the 1.2 million hectares commitment is considered. This approach helps ensure accurate estimates by reducing redundancy (Sewell et al., 2020).

Step 2: Calculating Total Commitments

Three different methodologies are utilised by Sewell et al. (2020) to estimate the total commitments, considering varying assumptions about overlap:

- **Method 1 (High Estimate):** This calculation assumes no commitment overlap. All country-specific commitments are aggregated, offering the maximum possible total. However, this method will likely overestimate the actual country commitment due to unrecognised overlaps.
- **Method 2 (Middle Estimate):** This approach considers each country's highest commitment for each category of restoration measures. It recognises overlaps within categories but treats commitments from different categories as cumulative. For instance, if a country has two commitments for wetland restoration of 100,000 and 150,000 hectares, only the larger value of 150,000 hectares is considered.
- **Method 3 (Low Estimate):** The most significant single commitment from any data source per country is used. For example, if there are commitments of 300,000 hectares from an LDN and 400,000 hectares from an NBSAP, we would use only the 400,000 hectares from the NBSAP, assuming it includes or supersedes the smaller LDN commitment.

5.6.2 Application of the Methodology

Following the Sewell et al. (2020) approach, this report ensures consistent and reliable coherence estimation and overlap between restoration commitments. This methodology

captures the complexities and interrelations of different commitments, providing a robust framework for analysis and comparison. The below table 5.6 shows the total estimates range of this database.

For detailed insights and a comprehensive framework, refer to the study by Sewell et al. (2020), which has significantly informed the analytical processes in this report.

Table 5.7 Total estimates range.

Description of the different estimates				
Name	**Description**	**Assumption**	**Example**	**Total (ha)**
High estimate	All targets added and combined per country	Assumes no overlap: Each target is additional to the others	E.g. NDC + LDN + highest Bonn + NBSAP	1,192,070,115
Middle estimate 1 (based on sub-category)	Only the highest target (between sources) per restoration measure (sub-category) per country	Assumes some overlap: that other sources with a smaller target for the same restoration measure (sub-category) are included within the highest estimate of another source	e.g. restore forest land NDC 300,000 > restore forest land LDN 200,000	1,139,526,242
Middle estimate 2 (based on the main category)	Only the highest target (between sources) per restoration measure category	Assumes some overlap: that other sources with a smaller target for the same	e.g. increase soil fertility 5,000,000 (NBSAP) > increase	1,101,109,222

	(main category) per country	restoration measure (main category) are included within the highest estimate of another source	soil fertility 1,500,000 (LDN)	
Low estimate	Only the single highest commitment between all sources, per country, regardless of measure	Assumes high overlap: All other smaller commitments for other sources are included	e.g. sum of targets under LDN > sum of targets under NDC or NBSAP or Highest Bonn	937,369,058

5.6.3 Data Validation and Update

Given the complexity of the data, which comes from different reports and platforms, it is essential to employ a validation process to ensure that all information is reliable and actionable.

5.6.3.1 Process of Updating the Database

Updating the existing global restoration commitments database involves a comprehensive approach that ensures the integration of new information while maintaining the consistency and reliability of previous data entries. The update process begins with collecting restoration commitments and reports from various international frameworks, including new pledges from conventions such as CBD, UNFCCC, UNCCD, and Bonn Challenge.

Once the new data is gathered, it is cross-referenced with the current database to avoid duplicate entries and accurately update existing commitments. This cross-reference compares the actual commitments and the submitted data year. The new entries are categorised according to the restoration commitment types, including the restoration intervention

categories and sub-categories, hectares of land committed, and submission years. These updates ensure the database remains dynamic and up-to-date for monitoring global restoration commitments.

5.6.3.2 Data Validation Steps

To ensure that the new data is accurate and reliable, a series of validation steps is undertaken:

- **Source Verification**: All new data entries are sourced from publicly available, officially published reports from the relevant UN websites and data portals. This ensures that only verifiable and legitimate information is included in the database.
- **Cross-Referencing with Previous Data**: Before adding new data, the database team cross-references the new entries with existing information to avoid duplication and to ensure that any updates to previous commitments are accurately reflected. In cases where countries have updated their restoration commitments, the older data is replaced with the most recent figures. For LDN commitments, these data were verified with the recent PRAIS 4 reports and internal data sources.
- **Unit Conversion and Consistency Checks**: New data often comes in various formats (e.g., hectares, kilometres, percentages, or other metrics). To maintain consistency, all entries are converted uniformly into hectares. This process ensures that comparisons between countries, regions, and initiatives are accurate and aligned with global standards.
- **Country Commitments vs Total Land Area**: A crucial validation step, adopted from the previous report methodology (Sewell et al., 2020), involves comparing each country's commitments to its total land area using FAO data from 2020. This comparison helps flag any countries that report commitments nearing or exceeding their total land area, thereby checking the plausibility of the reported commitments. Such discrepancies are flagged for further investigation and verification to ensure the data accuracy.
- **Peer Review and Feedback**: Once the data is entered into the database, it undergoes a peer review process where a secondary team reviews the entries for accuracy. Any discrepancies or unclear data points are flagged for further verification, and feedback is integrated to ensure the highest level of reliability.

5.6.4 Challenges in Data Collection, Analysis, and Assessment for Global Restoration Commitments

Data collection and analysis for global restoration commitments face significant challenges due to discrepancies and inconsistencies across multiple official data sources. Issues related to data formatting, language barriers, and inconsistent metrics further complicate the process.

1. Multiple Data Sources with Varied Information: The United Nations Convention to Combat Desertification (UNCCD) offers platforms that provide similar information but differ significantly in the recency and detail of data. For example,
   - Voluntary LDN Targets Page: Features older reports that may not reflect current restoration commitments (Voluntary LDN Targets).
   - Country Profiles Page: This page provides updated but sometimes inconsistent synopses of voluntary LDN targets, complicating accurate data aggregation (Country profiles | UNCCD).

2. Uneven Report Formatting: No standardised format for presenting restoration commitments varies significantly between these four commitment reports. This lack of uniformity can make it difficult to compare and consolidate data effectively.

3. Disparate Repositories Across Platforms: Finding the most current reports is challenging due to the distribution of information across different platforms, each updating at its own pace. This can lead to outdated data and increase the complexity of data retrieval.

4. Reporting in unofficial languages: Some reports submitted in unofficial UN languages by some countries pose significant challenges for translation, potentially leading to misinterpretation of data.

5. Varied Forms of Reporting Commitments: Commitments are reported in various units such as hectares (ha), square kilometres (km²), or percentages of land, often relative to a baseline. This necessitates additional calculations, introducing potential errors and inconsistencies in data analysis.

6. Lack of Clear Disclaimers and Data Verification: The absence of disclaimers or explanations concerning the recency of data and collection methodologies complicates the validation process, requiring additional time and effort to verify information.

These multifaceted challenges undermine the reliability of the global restoration commitments database, necessitating substantial time for cross-verifying information to ensure accuracy. A more streamlined and transparent approach to updating data and clarifying methodologies could mitigate many existing issues, enhancing the database's effectiveness in supporting global restoration goals.

5.7 Scoping for a Restoration Commitments Achievement Database

5.7.1 Existing Platforms

As global restoration efforts grow in scale and ambition, the need for reliable and transparent tracking of restoration achievements becomes increasingly essential. Several platforms have emerged to monitor, document and share restoration progress nationally and across smaller, community-led initiatives. These platforms vary in scope, data sources, and user bases, offering unique opportunities and challenges for tracking restoration commitments. In this section, we explore key platforms that document restoration achievements, assess their strengths and limitations, and identify opportunities for creating a more integrated and holistic restoration achievements database.

- **Restoration Barometer (IUCN):** The Restoration Barometer is a country-driven initiative that offers detailed insights into country-specific accomplishments and restoration projects. It tracks progress toward large-scale restoration targets like the Bonn Challenge and other global goals. This platform provides a structured mechanism to showcase national efforts by aligning government reports with global restoration targets. It is beneficial for aligning national and global commitments, but its reliance on country reporting can sometimes result in delays or incomplete data.

- **UNCCD PRAIS 4 Reporting portal:** The PRAIS (Performance Review and Assessment of Implementation System) under the UNCCD is a platform that allows countries to report progress toward Land Degradation Neutrality (LDN). PRAIS 4 provides voluntary reporting mechanisms where countries can share their achievements toward restoration targets under SO1 (Strategic Objective 1). While it includes some restoration data, PRAIS 4 often presents a challenge regarding optional data submission, which means the most recent achievements may not be consistently reflected.

- **Framework for Ecosystem Restoration Monitoring (FERM):** FERM, developed under the FAO-led Monitoring Taskforce for the UN Decade on Ecosystem Restoration, enables standardised data collection and visualisation of restoration progress. FERM combines data from different sources and offers basic and advanced monitoring tools, making it useful for governments and communities. This framework's transparency and integration with global sustainability goals provide a comprehensive way to track and report ecosystem restoration. It offers an opportunity to centralise data collection and ensure consistent monitoring practices across regions.

- **Restor Portal**: Restor is an extensive platform for worldwide nature conservation practitioners and restoration projects. It provides visibility for small-scale and large-scale projects and offers valuable information on local restoration efforts. The platform is user-driven, allowing individuals and organisations to track and share restoration accomplishments, helping to bridge the gap between government data and on-the-ground action.

- **Explore.Land Portal**: Like Restor, Explore Land focuses on mapping restoration projects and highlighting local and global initiatives. Its detailed geospatial information helps users identify restoration sites, progress, and challenges, complementing the official data from other platforms.

- **IUCN Contributions for Nature Portal:** This portal is designed to collect and document restoration projects mainly from IUCN members, which include state members and NGOs. It is a unique platform that bridges the gap between official and voluntary reporting. By incorporating data from various sectors, it offers the potential to build a more comprehensive and inclusive database of restoration achievements. The portal can serve as a centralised repository for global tracking of restoration projects, improving coordination between governments, NGOs, and private entities.

The first two examples mainly target official documentation, reporting, and monitoring of state members at the country scale accomplishments. The other four platforms provide a unique perspective by enabling NGOs, private sector entities, and grassroots organisations to share restoration efforts and achievements voluntarily. Restor and Explore land platforms are especially valuable for filling gaps left by official reporting mechanisms, as they cover more localised or smaller-scale projects that might not be included in national databases. However, their voluntary nature and the variety of stakeholders involved may lead to data quality and coverage variability.

The contributions for nature portal has the potential to bridge the gap between official government data and voluntary contributions by NGOs and other stakeholders. Drawing on data from state members and non-governmental actors alike can offer a more holistic view of restoration achievements, making it an ideal platform to centralise governmental and non-governmental restoration efforts.

5.7.2 Opportunities:

- **Enhanced Transparency:** Platforms like FERM and the Restoration Barometer ensure transparency by providing a centralised system for tracking restoration commitments and accomplishments. However, establishing a common achievement

database would further streamline and standardise the reporting of these accomplishments, reducing fragmentation and increasing the reliability of global restoration tracking.

- **Holistic Data Integration:** Combining official data from platforms like the Restoration Barometer and PRAIS 4 with voluntary contributions from platforms like Restor and Explore Land offers a more comprehensive view of restoration efforts at national and local scales. Integrating all this information into a single, unified Restoration Commitments Achievement Database would allow stakeholders to easily track official and grassroots restoration efforts, providing a complete understanding of progress toward global restoration goals.

- **Capacity for Future Expansion:** Platforms like the IUCN Contributions for Nature Portal have the potential to expand to serve as the central hub for a Restoration Commitments Achievement Database. By integrating data from governments, NGOs, the private sector, and civil society, such a database would foster a multi-stakeholder approach to restoration monitoring and reporting while also supporting better coordination and resource allocation.

- **Standardised Reporting:** A common achievement database could address one of the key challenges in restoration monitoring—the inconsistency in reporting formats and data standards. A unified platform would encourage countries, NGOs, and private sector actors to report their restoration achievements using a standardised framework, ensuring that data can be compared and aggregated globally, aligning with the Restoration Commitments Database structure.

5.7.3 Limitations:

- **Data Gaps and Inconsistencies**: The voluntary nature of reporting on platforms like PRAIS 4 and Restor may lead to gaps or inconsistencies in the data, making it challenging to generate a fully comprehensive and up-to-date database. However, establishing a common achievement database could help address this limitation by creating a standardised and universally accepted reporting framework, encouraging more consistent submissions across platforms.

- **Dependency on National Reporting:** Platforms like the Restoration Barometer rely heavily on country-driven reporting, which can lead to delays or incomplete data. A centralised Restoration Commitments Achievement Database would mitigate this issue by integrating multiple data streams—from governments, civil society, and the private sector—ensuring that restoration efforts are captured from various sources, even when official reporting is delayed.

- **Scalability and Access:** While current platforms cater to a mix of government and voluntary actors, the lack of a unified database makes it difficult to scale restoration monitoring effectively. A Restoration Commitments Achievement Database would create a scalable solution that supports global monitoring, from small-scale community projects to large national efforts, ensuring that no restoration effort is undocumented.

5.7.4 Summary of Data Availability on Achievements on Various Platforms

Platforms such as the Restoration Barometer and UNCCD PRIAS 4 report on government information on restoration achievements at the national level.

5.7.4.1 Restoration Barometer Report (2022) Overview:

A total of 18 countries reported restoration progress in 2022, with significant restoration efforts seen in regions like Africa (e.g., Kenya, Ghana, and Uganda) and Latin America (e.g., Mexico, Costa Rica, and Peru). Several countries, such as Mexico, are making significant strides in large-scale land restoration, which reported the most extensive area under restoration at 5.2 million hectares. Below is the country-specific data from the Restoration Barometer:

Bangladesh: 198,763 hectares under restoration reported. 44% in coastal and mangrove ecosystems and 38% in forests and woodlands. Community-led mangrove restoration through the Mangroves for the Future platform.

Cameroon: 100,426 hectares under restoration reported. Targets include mangrove, forest, and agricultural land restoration.

Colombia: 559,509 hectares under restoration reported. Strategies include establishing forest Protected Areas, planting native tree species, and managing invasive species.

Costa Rica: 498,279 hectares under restoration were reported, 11% of which were farmland and mixed-use areas; efforts focus on agroforestry and natural regeneration.

El Salvador: 278,908 hectares under restoration reported. Agroforestry, reforestation, and soil rehabilitation on farmlands are the major interventions.

Ghana: 638,338 hectares under restoration reported. Forest and farmland restoration with significant community engagement are the primary targets.

Guatemala: 379192 hectares are under restoration, of which 92% are in forest and woodland ecosystems, including agroforestry and silviculture.

Kazakhstan: 575,185 hectares under restoration are reported, predominantly in forests and woodlands, supported by national forest surveys and afforestation efforts.

Kenya: 2,621,624 hectares under restoration reported. Restoration includes farmland and mixed-use areas, supported by the Regreening Africa App.

Kyrgyzstan: 136,249 hectares under restoration were reported, and the focus was on land and forest restoration with sustainable management plans.

Malawi: 1,746,958 hectares under restoration reported. This includes the restoration of degraded hills and community-led agroforestry projects.

Mexico: 5,219,984 hectares under restoration reported. Efforts focus on forest, farmland, and biodiversity protection.

Mozambique: 17,020 hectares under restoration reported. Mangrove restoration targets as part of the National Mangrove Strategy.

Peru: 90,552 hectares under restoration have been reported, and ecosystem restoration across farmlands and mixed-use areas is the primary intervention.

Rwanda: 597,718 hectares under restoration reported. Projects focus on farmlands, forests, and wetlands, supported by the ROAM assessment.

Sri Lanka: 5,241 hectares are under restoration, and 99% of restoration efforts are in forest and woodland ecosystems.

Tajikistan: 90,074 hectares under restoration reported. Initiatives include reforestation and land management to support biodiversity.

Uganda: 650,295 hectares under restoration reported. Restoration focused on farmlands and forests, including agroforestry and community engagement.

5.7.4.2 PRAIS 4 Reporting Overview (2022):

This platform includes data on targets achieved under the UNCCD's voluntary SO1 goals. It gathers contributions from multiple countries that submit national-level reports detailing their achievements with intervention details. Here are some examples of country-specific achievements reported through PRAIS:

Ecuador:

- 25,000 hectares of forest conserved, including 5,000 hectares of páramo forest restored, 8,000 hectares implemented with sustainable agricultural practices, and 9,753 hectares managed with improved livestock practices.
- 2,500 hectares of degraded mountainous ecosystems restored.
- 4,500 hectares of productive lands rehabilitated through irrigation systems and agricultural practices.
- 150 hectares reforested with native tree species, restoring watersheds across multiple cantons.

Niger:

- 4,440,500 hectares of degraded land have been restored, contributing significantly to its land restoration efforts.
- 252,101 hectares of cultivated land have been restored, addressing trends of negative productivity in primary crop areas.
- 100,070 hectares of forests, savannas, and other mixed land types rehabilitated to support biodiversity conservation.
- Additionally, Niger has sequestered 292,000 tonnes of carbon in soil and/or biomass, covering an area of 2,484,984 hectares, supporting climate change mitigation efforts through carbon sequestration.

Rwanda:

- A total of 210,300 hectares of land degradation neutrality (LDN) actions have been implemented across all five provinces by 2030.
- 3,400 hectares of SOC (soil organic carbon) degradation has been reduced or improved at the country level compared to 2019.
- 213,200 hectares of stressed or declined land productivity has been improved across the five provinces of Rwanda.
- 45,659 hectares of land cover degradation has been halted or reduced to zero by 2030.
- 724,695 hectares of forest cover have increased by 30% from 2017 to 2024, as per national commitments.

6.0 Conclusions and Recommendations

This section provides a comprehensive overview of the progress made toward global ecosystem restoration commitments, drawing from the data collected and analysed throughout the report. It highlights the key findings, identifies gaps in data collection, and explores opportunities for future improvements in global restoration commitment monitoring.

6.1 Global Commitment's Key Findings

Between 2020 and 2024, global commitments to Land Degradation Neutrality (LDN) increased by 32.02%, driven by the pressing need to combat land degradation, which is critical for food security, climate adaptation, and sustainable livelihoods. Large-scale initiatives in regions like the Middle East Green Initiative, GGW and several other African initiatives, supported by financial and technical assistance from international mechanisms such as the Global Environment Facility (GEF), have enabled countries to expand their restoration targets. The clarity of available data has played a vital role, allowing countries to track land degradation accurately and plan effective interventions.

In contrast, National Biodiversity Strategies and Action Plans (NBSAPs) experienced a more modest increase of 11.14%. This slower growth can be attributed due to the complexities of aligning biodiversity conservation with broader economic and development goals. The multifaceted nature of biodiversity conservation, spanning sectors like agriculture and forestry, makes integration into national strategies more challenging. Additionally, limited financial resources and technical capacity have hindered countries from expanding their NBSAP commitments and effectively tracking biodiversity outcomes.

Nationally Determined Contributions (NDCs) rose by 28.42%, possibly due to global climate agreements such as the Paris Agreement, which require countries to gradually strengthen their climate targets. Technological advancements, especially in renewable energy, have made it easier for governments to adopt more ambitious climate goals. Financial support from initiatives like the Green Climate Fund has also empowered developing nations to scale up their climate efforts, further supported by private sector involvement.

However, commitments to the Bonn Challenge decreased by 1.92%. This decline can be attributed to several factors, including financial constraints, as many countries face difficulties securing funding for large-scale restoration projects. For developing nations, pressing issues like poverty alleviation, political instability and food security have taken precedence over long-term restoration goals. Moreover, inconsistencies in monitoring and reporting frameworks

have made it challenging to track restoration progress, contributing to reduced pledges. The complexity of implementing large-scale restoration projects, especially in resource-constrained regions, has further hampered progress.

The role of robust data and documentation is crucial in driving the success of these commitments. The significant increase in LDN commitments, for instance, is partly due to reliable data that enables countries to track degradation, identify priority areas for restoration, and align their efforts with international frameworks. This same data-driven approach is essential for NBSAPs and NDCs, as improvements in data collection allow countries to track biodiversity and climate progress more effectively. Conversely, the decline in Bonn Challenge commitments highlights challenges when monitoring frameworks are inconsistent, making it harder for countries to demonstrate success and secure ongoing support.

6.2 Commitments Per Region

Central and South America

Central and South America report a high estimate of 210.14 million hectares for restoration commitments, comprising about 17.4% of the global total estimate. The range from the lowest estimate of 175 million hectares to the highest reflects differences in national commitments and varying restoration methodologies, underscoring the need for consistent and harmonised approaches across countries.

East Asia

East Asia shows a remarkably narrow range of estimates, from 107.93 million hectares to 109.95 million hectares, indicating high consistency in reporting and perhaps less variability in restoration activity types. This region contributes to approximately 9.1% of the global high estimate, emphasising its moderate but significant role in global restoration efforts.

Japan, Korea, and Oceania

In Japan, Korea, and Oceania, all estimates are closely aligned around 60.62 million hectares, showing exceptional consistency in restoration commitments across reports. This uniformity suggests effective coordination and standardised reporting within these countries, providing a clear picture of the restoration goals set within this region.

Middle East and North Africa

The Middle East and North Africa have a high estimate of 102.65 million hectares, which is around 8.5% of the total global restoration commitments. The estimated range from 82.40 million hectares to this high point indicates some variation in the goals and methodologies, likely influenced by the diverse environmental and socio-economic conditions across this arid and semi-arid region.

North America

North America's restoration commitments range from 23.47 million hectares to 45.51 million hectares, with a high estimate making up roughly 3.8% of the global total. The variation here may reflect different priorities and approaches to restoration, particularly between the United States and Canada, which have diverse landscapes and restoration needs.

Russia, Eastern Europe, and Central Asia

This region shows estimates ranging from 12.4 million hectares to 15.08 million hectares, reflecting moderate variability in restoration reporting. These figures underline the region's growing involvement in restoration efforts, which are crucial for its vast boreal forests and steppe ecosystems.

South Asia

South Asia's figures vary significantly, from a low of 62.65 million hectares to a high of 94.10 million hectares, indicating a broad scope of restoration activities and diverse interpretations of commitments. This range highlights the complexity of restoration in a region with dense populations and significant environmental degradation.

Southeast Asia

Southeast Asia reports a range from 54.68 million hectares to 57.20 million hectares, illustrating the challenges in aligning restoration commitments across countries with significant tropical forests and biodiversity. The variability underscores the need for regional cooperation and shared methodologies.

Sub-Saharan Africa

Sub-Saharan Africa's highest high estimate for restoration commitments reaches 480.33 million hectares, representing about 39.6% of the global high estimate. The variability, from 317.5 to 480.33 million hectares, suggests differing restoration scopes and methodologies

among entities, emphasising the importance of realistic and achievable targets in restoration efforts.

Western and Central Europe

Western and Central Europe show commitments ranging from 14.18 million hectares to 16.48 million hectares, reflecting the region's focused but significant restoration efforts, particularly in enhancing biodiversity and reforesting degraded landscapes. This represents approximately 1.4% of the global high estimate.

6.3 Commitments per Category

The data provides insights into various restoration activities undertaken by different countries, focusing on key categories such as forest land restoration, soil fertility improvements, cropland restoration, and wetlands/mangrove restoration. Here is a detailed analysis of the most prominent categories across the countries:

6.3.1 Forest Land Restoration

- Forest land restoration is the most prominent category across several countries. It reflects the global priority on forest restoration to combat deforestation, sequester carbon, and support biodiversity.
- **Notable countries in this category:**
    - **Brazil**: With 16.28 million hectares under forest land restoration, Brazil's commitment highlights its critical role in maintaining tropical forest ecosystems, such as the Amazon.
    - **Cuba**: Cuba commits to restoring/improving 0.93 million hectares of forest land, showcasing its focus on biodiversity conservation and climate change mitigation.
    - **Honduras**: Forest restoration in Honduras accounts for over 2.8 million hectares, reflecting the country's ambition to tackle deforestation while improving land use sustainability.

6.3.2 Increase and Manage Protected Areas

- **Biodiversity and Ecosystem Services**: Countries with significant protected areas or grassland ecosystems emphasise restoration efforts to enhance biodiversity, ecosystem services, and land-use sustainability.
- **Notable countries in this category**:

- **Australia**: Australia's protection of 60 million hectares of land showcases its long-standing commitment to biodiversity conservation.
- **Angola**: committed to increasing protected area covers 9.17 million hectares, underscoring efforts to prevent deforestation and enhance biodiversity conservation while promoting sustainable land management practices that benefit local communities and ecosystems.
- **Peru**: committed to restoring and improving the protected area of approximately 22.19 million hectares, demonstrating its strong commitment to biodiversity conservation and environmental sustainability.

6.3.3 Soil Fertility and Carbon Stock Improvement

- **Climate Mitigation Focus**: Countries prioritising soil fertility and carbon stock improvement focus on land productivity and carbon sequestration, which are crucial for mitigating climate change and enhancing land resilience. This category, vital for combating land degradation and climate change, makes up 18.1% of the grand total of restoration commitments globally.
- **Notable countries in this category**:
  - **China**: China leads the efforts with a massive 104 million hectares committed to increasing soil fertility and carbon stocks, highlighting the country's large-scale approach to combating soil degradation and enhancing carbon storage capacity.
  - **The Kingdom of Saudi Arabia:** committed to increasing soil fertility and carbon stock across 6.45 million hectares. This initiative reflects the country's dedication to enhancing agricultural productivity while promoting sustainable land management practices aligned with environmental conservation goals.
  - **Australia**: committed to increasing soil fertility and carbon stock across 6 million hectares. This initiative highlights the country's commitment to enhancing agricultural resilience and sustainability while addressing climate change challenges.

6.3.4 Wetlands, Peatlands, and Mangroves Restoration

- **Ecosystem-Specific Restoration**: Restoration of wetlands, peatlands, and mangroves is vital for coastal protection, biodiversity conservation, and carbon storage. Countries with significant coastlines or vulnerable coastal ecosystems emphasise this category. Wetlands, peatlands, and mangrove restoration accounts for 10.4% of the global restoration commitments.

- **Notable countries in this category**:
    - ○ **Moldova:** Committed to restoring and improving wetlands, peatlands, and mangroves, covering approximately 150,000 hectares.
    - ○ **Pakistan**: With commitments to restore around 0.8 million hectares of wetlands and peatlands, Pakistan aims to enhance coastal resilience against rising sea levels and protect biodiversity hotspots.
    - ○ **Uganda:** Committed to restoring and improving wetlands, peatlands, and mangroves, covering approximately 0.49 million hectares.

6.3.5 Cropland Restoration and Improvement

- **Food Security and Sustainable Agriculture**: Cropland restoration, essential for agricultural productivity, accounts for 12.3% of the total restoration commitments. Cropland restoration is vital in ensuring food security while maintaining soil health. Countries with significant agricultural activities prioritise this category to ensure the productivity of their arable lands.
- **Notable countries in this category:**
    - ○ **Cuba**: Restoration of cropland stands at approximately 1.59 million hectares, a solid commitment to revitalise agricultural lands while enhancing food production.
    - ○ **Nigeria:** committed to restoring approximately 1.23 million hectares of cropland, highlighting its dedication to enhancing agricultural productivity and sustainability.
    - ○ **Indonesia**: committed to restoring around 12 million hectares of cropland, demonstrating its commitment to sustainable agricultural practices and food security.

6.4 Data Gaps and Future Directions

Unified restoration commitments database: This database consolidates restoration commitments from multiple global commitments and should serve as a central repository for official government commitments. However, a system of continuous updates should be implemented to ensure that data remains current, reducing discrepancies between various data sources and allowing real-time commitment tracking.

Creation of a Global Achievements database: In addition to a commitments database, establish a Global Restoration Achievements Database to document actual restoration outcomes and successes. This Achievements Database would capture data on completed

restoration activities, hectares restored, biodiversity improvements, and carbon sequestration achieved, among other metrics. The database should link directly to the Restoration Commitments Database, allowing for easy comparison between restoration pledges and achievements. Incorporate tools for data visualisation to present progress in a user-friendly format, making it accessible to decision-makers, NGOs, and the public.

Standardisation of Report formats: Implement standardised reporting formats across all Rio conventions and commitments to ensure consistent documentation of both commitments and achievements. Define a minimum standard for reporting, including sections such as land area under restoration, biodiversity impact, carbon sequestration, and other relevant metrics. Ensure that all data is reported in consistent units of measurement (e.g., hectares, tonnes of CO_2) to avoid discrepancies and reduce the need for additional calculations.

Improved data transparency and accessibility: Ensure that all restoration data, both commitments and achievements, is made publicly accessible through an open-access platform. The Unified database, consisting of the Restoration Commitments Database and the Achievements Database, should be fully transparent, allowing stakeholders across governments, NGOs, and the private sector to access and utilise the data. Build data visualisation tools that present restoration progress in a clear and accessible manner, helping users understand both the commitments made and the outcomes achieved.

Capacity-Building for Data Collection and Reporting: Provide capacity-building programs to support countries, especially those with limited resources, in improving their data collection and reporting capabilities. Offer training in using new technologies (remote sensing, GIS) and data management systems to enhance the accuracy and timeliness of reporting on restoration commitments and achievements. Establish partnerships between international organisations, governments, and NGOs to provide technical support and financial resources for improving restoration data collection.

Interagency and Cross-Sectoral Coordination: Strengthen interagency and cross-sectoral coordination to integrate restoration commitments and achievements into national development plans. Ensure that sectors such as forestry, agriculture, and urban planning work together to report restoration efforts, with data directly feeding into the Unified Restoration Commitments and Achievements databases. Coordinate efforts across international conventions (e.g., UNFCCC, CBD, UNCCD) and Bonn Challenge to ensure alignment between national restoration goals and global frameworks such as the Sustainable Development Goals (SDGs).

Data Verification and Disclaimers: Introduce clear disclaimers and robust data verification processes to ensure the reliability of both commitment and achievement data. Implement a peer review or third-party verification process for submitted data to ensure accuracy and credibility. Include disclaimers about the data's methodologies and recency to provide users context and transparency.

Annex:

Table 1: IUCN Restoration Intervention Typology for Terrestrial Ecosystems

Ecosystem	Intervention types (1st level)	Intervention types (2nd level)	Intervention types 3rd level
Deserts and semi-deserts	Improving water access for native wildlife		
Deserts and semi-deserts	Natural regeneration	-	
Deserts and semi-deserts	Natural regeneration	Passive natural regeneration	Reducing or eliminating the sources of degradation and allowing recovery time (resting periods)
Deserts and semi-deserts	Natural regeneration	Passive natural regeneration	Other (describe)
Deserts and semi-deserts	Natural regeneration	Assisted natural regeneration	Scarification
Deserts and semi-deserts	Natural regeneration	Assisted natural regeneration	Grazing management
Deserts and semi-deserts	Natural regeneration	Assisted natural regeneration	Vegetation management (incl. composition)
Deserts and semi-deserts	Natural regeneration	Assisted natural regeneration	Fire management

Deserts and semi-deserts	Natural regeneration	Assisted natural regeneration	Reintroduction of native species
Deserts and semi-deserts	Natural regeneration	Assisted natural regeneration	Other (describe)
Deserts and semi-deserts	Artificial regeneration	-	
Deserts and semi-deserts	Artificial regeneration	Planting/seeding	
Deserts and semi-deserts	Artificial regeneration	Terracing/other forms of soil manipulation	
Deserts and semi-deserts	Artificial regeneration	Interventions targeted at water management and / or sustainable use including harvesting, catchment, reticulation, etc.	
Deserts and semi-deserts	Artificial regeneration	Other (describe)	
Deserts and semi-deserts	Land/water protection	-	
Deserts and semi-deserts	Land/water protection	Site / area / habitat protection e.g. .establishment of Community Conserved Areas / Protected Areas	
Deserts and semi-deserts	Land/water protection	Other (describe)	
Deserts and semi-deserts	Invasive/problematic species control	-	

Deserts and semi-deserts	Management of problematic native species	-	
Deserts and semi-deserts	Other	-	
Forests and woodlands	Land and water protection / Conservation actions		
Forests and woodlands	Land and water protection / Conservation actions	Site/area / habitat protection	
Forests and woodlands	Land and water protection / Conservation actions	Planting/seeding/natural regeneration of buffers (mixed stands of native species)	
Forests and woodlands	Land and water protection / Conservation actions	Planting steppingstones (cluster, nucleation)	
Forests and woodlands	Land and water protection / Conservation actions	Planting/seeding corridors of mixed stands of native species	
Forests and woodlands	Land and water protection / Conservation actions	Restoring cultural forest ecosystems	
Forests and woodlands	Land and water protection / Conservation actions	Reintroducing wildlife and bird species	
Forests and woodlands	Land and water protection / Conservation actions	Other (describe)	
Forests and woodlands	Natural regeneration	Passive natural regeneration	-

Forests and woodlands	Natural regeneration	Passive natural regeneration	Reducing or eliminating the sources of degradation and allowing recovery time (removing disturbances)
Forests and woodlands	Natural regeneration	Passive natural regeneration	Other (describe)
Forests and woodlands	Natural regeneration	Assisted natural regeneration	Farmer-assisted natural regeneration
Forests and woodlands	Natural regeneration	Assisted natural regeneration	-
Forests and woodlands	Natural regeneration	Assisted natural regeneration	Native recolononisation
Forests and woodlands	Natural regeneration	Assisted natural regeneration	Restoring natural flooding regimes (remove dams or barriers, create wetlands)
Forests and woodlands	Natural regeneration	Assisted natural regeneration	Site stabilisation
Forests and woodlands	Natural regeneration	Assisted natural regeneration	Soil improvement (fertiliser, liming, biostimulants)
Forests and woodlands	Natural regeneration	Assisted natural regeneration	Phytoremediation

Forests and woodlands	Natural regeneration	Assisted natural regeneration	Re-establish hydrologic connectivity or physical processes for watersheds
Forests and woodlands	Natural regeneration	Assisted natural regeneration	Other
Forests and woodlands	Artificial regeneration	-	
Forests and woodlands	Artificial regeneration	Artificial regeneration (through planting of seedlings or seeds in mixtures)	
Forests and woodlands	Artificial regeneration	Reconnecting fragmented forests by planting mixed stands of native species	
Forests and woodlands	Artificial regeneration	Planting on steep slopes and along waterways to avoid or recover from erosion	
Forests and woodlands	Artificial regeneration	Other (describe)	
Forests and woodlands	Silviculture	-	
Forests and woodlands	Silviculture	Replacing non-native species with native species to increase diversity	
Forests and woodlands	Silviculture	Transformation (continuous cover, gap creation and natural regeneration or underplanting)	
Forests and woodlands	Silviculture	Conversion (clearfell non-natives and plant mixtures of natives)	

Forests and woodlands	Silviculture	Partial overstorey removal (gap creation, retention thinning), w/wo underplanting	
Forests and woodlands	Silviculture	Thinning (cleaning, density reduction or gap creation) to alter structure	
Forests and woodlands	Silviculture	Retaining legacy trees and deadwood or creating artificial cavities, wounding, fell and leave, etc., to create habitats	
Forests and woodlands	Silviculture	Restoring natural fire regime (incl. re-introduction, fuel reduction, prescribed burning)	
Forests and woodlands	Silviculture	Post-fire reforestation via erosion control, mulching, planting etc.	
Forests and woodlands	Silviculture	Maintaining or closing and decommissioning roads	
Forests and woodlands	Silviculture	Selective logging (manage / reduced impact logging)	
Forests and woodlands	Silviculture	Watershed protection and erosion control	
Forests and woodlands	Silviculture	Fire management (including controlled burning)	
Forests and woodlands	Silviculture	Climate impact mitigation and adaptation (assisted migration, density reduction)	
Forests and woodlands	Silviculture	Other (describe)	

Forests and woodlands	Planted forests and woodlots	-	
Forests and woodlands	Planted forests and woodlots	Nucleation or cluster planting (planting of small patches of trees as focal area for recovery)	
Forests and woodlands	Planted forests and woodlots	Planting or direct seeding with native spp. (interplanting w/ nurse crop, taungya, planting group, framework species, or Miyawaki methods)	
Forests and woodlands	Planted forests and woodlots	Windbreaks to mitigate wind impact while increasing crop yields	
Forests and woodlands	Planted forests and woodlots	Reclamation of mined lands with native or non-native species	
Forests and woodlands	Planted forests and woodlots	Enrichment planting or underplanting	
Forests and woodlands	Planted forests and woodlots	Woodlot management (and controlled fuelwood gathering)	
Forests and woodlands	Planted forests and woodlots	Other (describe)	
Forests and woodlands	Agroforestry/Silvopastoral systems	-	
Forests and woodlands	Agroforestry/Silvopastoral systems	Streamside buffers (riparian zones)	
Forests and woodlands	Agroforestry/Silvopastoral systems	Home gardens	

Forests and woodlands	Agroforestry/Silvopastoral systems	Combining trees with crops and/or animals	
Forests and woodlands	Agroforestry/Silvopastoral systems	Combining trees with grazing on pastures, rangelands, or on-farms	
Forests and woodlands	Agroforestry/Silvopastoral systems	Planting native trees on private pastoral farmlands	
Forests and woodlands	Agroforestry/Silvopastoral systems	Other (describe)	
Forests and woodlands	Watershed protection and erosion control	-	
Forests and woodlands	Invasive/problematic species control	-	
Forests and woodlands	Management of invasive native species (incl. diseases)	-	
Forests and woodlands	Other (describe)	-	
Grasslands, shrublands and savannahs	Natural regeneration	-	
Grasslands, shrublands and savannahs	Natural regeneration	Passive natural regeneration	-
Grasslands, shrublands	Natural regeneration	Passive natural regeneration	Reducing or eliminating the sources of

and savannahs			degradation and allowing recovery time
Grasslands, shrublands and savannahs	Natural regeneration	Passive natural regeneration	Other (describe)
Grasslands, shrublands and savannahs	Natural regeneration	Assisted natural regeneration	-
Grasslands, shrublands and savannahs	Natural regeneration	Assisted natural regeneration	Reviving fire management regimes (controlled burns)
Grasslands, shrublands and savannahs	Natural regeneration	Assisted natural regeneration	Intensive kralling / restriction of herd movement
Grasslands, shrublands and savannahs	Natural regeneration	Assisted natural regeneration	Cloud seeding
Grasslands, shrublands and savannahs	Natural regeneration	Assisted natural regeneration	Reviving herd movements (e.g. de-fragmentation) / traditional management systems
Grasslands, shrublands and savannahs	Natural regeneration	Assisted natural regeneration	Reintroduction of native species
Grasslands, shrublands	Natural regeneration	Assisted natural regeneration	Other

and savannahs			
Grasslands, shrublands and savannahs	Artificial regeneration	-	
Grasslands, shrublands and savannahs	Artificial regeneration	Reseeding with native species	
Grasslands, shrublands and savannahs	Artificial regeneration	Shrub planting	
Grasslands, shrublands and savannahs	Artificial regeneration	Terracing and other soil manipulation measures	
Grasslands, shrublands and savannahs	Artificial regeneration	Soil augmentation (e.g. biochar, large scale fertilisation)	
Grasslands, shrublands and savannahs	Artificial regeneration	Promoting water capture and infiltration to locally increase soil moisture e.g. irrigation, reticulation, terracing, stone boundaries)	
Grasslands, shrublands and savannahs	Artificial regeneration	Other (describe)	

Grasslands, shrublands and savannahs	Land / water protection	-	
Grasslands, shrublands and savannahs	Land / water protection	Site / area / habitat protection e.g. establishment of Community Conserved Areas / Protected Areas	
Grasslands, shrublands and savannahs	Land / water protection	Corridor re-creation and / or establishment	
Grasslands, shrublands and savannahs	Land / water protection	Other (describe)	
Grasslands, shrublands and savannahs	Invasive/problematic species control	-	
Grasslands, shrublands and savannahs	Management of invasive native species (incl. diseases)	-	
Grasslands, shrublands and savannahs	Implementing participatory management systems with local land users	-	
Grasslands, shrublands and savannahs	Other (describe)		
Rivers, streams	Natural regeneration	Passive natural regeneration	-

and lakes (POINT)			
Rivers, streams and lakes (POINT)	Natural regeneration	Passive natural regeneration	Reducing or eliminating the sources of degradation and allowing recovery time
Rivers, streams and lakes (POINT)	Natural regeneration	Assisted natural regeneration / Actions related to species management and conservation	-
Rivers, streams and lakes (POINT)	Natural regeneration	Assisted natural regeneration / Actions related to species management and conservation	Reintroduction of native species (e.g. stocking of fish)
Rivers, streams and lakes (POINT)	Natural regeneration	Assisted natural regeneration / Actions related to species management and conservation	Other
Rivers, streams and lakes (POINT)	Artificial regeneration / Actions to improve and / or enhance water quality and / or flow	-	
Rivers, streams and lakes (POINT)	Artificial regeneration / Actions to improve and / or enhance water quality and / or flow	Removal of unused or disused dams	
Rivers, streams and lakes (POINT)	Artificial regeneration / Actions to improve and / or enhance water quality and / or flow	Management of dams to ensure dynamic E-flow releases, improve / ensure longitudinal and vertical connectivity	

Rivers, streams and lakes (POINT)	Artificial regeneration / Actions to improve and / or enhance water quality and / or flow	Improvement of water quality e.g. dredging, reducing industrial waste flow, improving wastewater treatment	
Rivers, streams and lakes (POINT)	Artificial regeneration / Actions to improve and / or enhance water quality and / or flow	Other (describe)	
Rivers, streams and lakes (POINT)	Invasive/problematic species control		
Rivers, streams and lakes (POINT)	Management of invasive native species (incl. diseases)		
Rivers, streams and lakes (POINT)	Land / water protection	-	
Rivers, streams and lakes (POINT)	Land / water protection	Site / area / habitat protection e.g. .establishment of Community Conserved Areas / Protected Areas	
Rivers, streams and lakes (POINT)	Other (describe)		
Rivers, streams and lakes (DIFFUSE)	Natural regeneration	Passive natural regeneration	Reducing or eliminating the sources of degradation and allowing recovery time
Rivers, streams	Natural regeneration	-	

and lakes (DIFFUSE)			
Rivers, streams and lakes (DIFFUSE)	Natural regeneration	Passive natural regeneration	-
Rivers, streams and lakes (DIFFUSE)	Natural regeneration	Assisted natural regeneration	-
Rivers, streams and lakes (DIFFUSE)	Natural regeneration	Assisted natural regeneration	Removal of non-native terrestrial vegetation within the landscape to improve river flow
Rivers, streams and lakes (DIFFUSE)	Natural regeneration	Assisted natural regeneration	Removal of overgrown (native) vegetation in flood plains
Rivers, streams and lakes (DIFFUSE)	Natural regeneration	Assisted natural regeneration	Other (describe)
Rivers, streams and lakes (DIFFUSE)	Artificial regeneration	-	
Rivers, streams and lakes (DIFFUSE)	Artificial regeneration	Catchment management e.g. prevention of soil loss through agricultural interventions	
Rivers, streams and lakes (DIFFUSE)	Artificial regeneration	Channel management e.g. stabilisation through vegetation	

Rivers, streams and lakes (DIFFUSE)	Artificial regeneration	Ensuring room for the river including connection between river and floodplain and improving channel structure e.g. creation of log jams	
Rivers, streams and lakes (DIFFUSE)	Artificial regeneration	Groundwater management / aquifer recharge activities e.g. allowing natural flooding	
Rivers, streams and lakes (DIFFUSE)	Artificial regeneration	Prevention of illegal mining / ensuring mining compliance	
Rivers, streams and lakes (DIFFUSE)	Artificial regeneration	Other	
Rivers, streams and lakes (DIFFUSE)	Invasive/problematic species control	-	
Rivers, streams and lakes (DIFFUSE)	Management of invasive native species (incl. diseases)	-	
Rivers, streams and lakes (DIFFUSE)	Land / water protection	-	
Rivers, streams and lakes (DIFFUSE)	Land / water protection	Site / area / habitat protection e.g. .establishment of Community Conserved Areas / Protected Areas	
Rivers, streams	Other (describe)		

and lakes (DIFFUSE)			
Peatlands	Natural regeneration	Passive natural regeneration	Reducing or eliminating the sources of degradation and allowing recovery time
Peatlands	Natural regeneration	Passive natural regeneration	-
Peatlands	Assisted natural regeneration	Fire prevention change to management to account for wetlands where fire regimes may be beneficial e.g. prescribed burns for bogs	
Peatlands	Assisted natural regeneration	Reintroduction of native species	
Peatlands	Assisted natural regeneration	Other	
Peatlands	Artificial regeneration	-	
Peatlands	Artificial regeneration	Re-wetting / raising water table	
Peatlands	Artificial regeneration	Re-vegetation by characteristic species	
Peatlands	Artificial regeneration	Reduction of erosion	
Peatlands	Artificial regeneration	Influencing water abstraction from supply aquifer	
Peatlands	Artificial regeneration	Reducing / halting nutrient input from catchment	
Peatlands	Artificial regeneration	Re-establishment of traditional mowing / grazing systems (only for Fen)	
Peatlands	Land / water protection	-	

Peatlands	Land / water protection	Site / area / habitat protection e.g. .establishment of Community Conserved Areas / Protected Areas	
Peatlands	Land / water protection	Other	
Peatlands	Invasive/problematic species control		
Peatlands	Management of invasive native species (incl. diseases)		
Coasts and mangroves	Natural regeneration	-	
Coasts and mangroves	Natural regeneration	Passive natural regeneration	Reducing or eliminating the sources of degradation and allowing recovery time
Coasts and mangroves	Natural regeneration	Passive natural regeneration	-
Coasts and mangroves	Natural regeneration	Assisted natural regeneration	-
Coasts and mangroves	Natural regeneration	Assisted natural regeneration e.g removal of pollutants	
Coasts and mangroves	Artificial regeneration	-	
Coasts and mangroves	Artificial regeneration	Capture or restore sediment flows (e.g., fence barriers)	
Coasts and mangroves	Artificial regeneration	Reduce wave energy (e.g., bamboo walls, offshore reefs)	
Coasts and mangroves	Artificial regeneration	Reprofiling and changing the elevation of the soil, relative to sea level	
Coasts and mangroves	Artificial regeneration	Planting of mangroves	

Coasts and mangroves	Artificial regeneration	Broadcasting of collected seeds/propagules onto an incoming tide and / or from a drone	
Coasts and mangroves	Artificial regeneration	Removal of encroaching vegetation (e.g. on sand dunes)	
Coasts and mangroves	Restore hydrology (channel creation, remove or breach aquaculture walls, clear channel blockages, dam removal)		
Coasts and mangroves	Site preparation - grazing exclusion, vegetation clearance and suppression		
Coasts and mangroves	Invasive/problematic species control		
Coasts and mangroves	Improving surface water quality to promote recolonization of native species (seagrasses)		
Coasts and mangroves	Artificial fencing to prevent sand loss / erosion (dunes)		
Coasts and mangroves	Land / water protection	-	
Coasts and mangroves	Land / water protection	Site / area / habitat protection e.g. .establishment of Community Conserved Areas / Protected Areas	
Coasts and mangroves	Other (describe)		
Urban areas	Conversion of gray infrastructure to green e.g. de paving roads, removing sea walls and restoring mangroves		
Urban areas	Restoration of urban waterways to semi-natural condition (measured in kilometres)		
Urban areas	Creation of blue spaces / semi-natural water reservoirs		
Urban areas	Improvement of water quality in urban waterways / wetlands		

Urban areas	Restoration of catchment zones		
Urban areas	Increasing extent and complexity of tree canopy		
Urban areas	Creation / enhancement of habitat for native species of wildlife		
Urban areas	Creation of wild gardens / yards for native species		
Urban areas	Creation of green spaces / green belts (native flora) for cooling, air filtration and mental health		
Urban areas	Creation of green roofs		
Urban areas	Development of peri-urban food systems		
Urban areas	Invasive/problematic species control		
Urban areas	Management of invasive native species (incl. diseases)		
Urban areas	Utilisation of native species in specific areas such as roadways and islands for erosion control, stormwater runoff		
Urban areas	Rehabilitation of extractive areas, e.g. quarries within city boundaries		
Urban areas	Land / water protection	-	
Urban areas	Land / water protection	Site / area / habitat protection e.g. establishment of Community Conserved Areas / Protected Areas	
Urban areas	Land / water protection	Creation of wildlife corridors, improving connectivity between Protected Areas, enlargement and / or enrichment of forest fragments	

Urban areas	Land / water protection	Other	
Urban areas	Other (describe)		
Farmlands and mixed-use areas	Improving land management	-	
Farmlands and mixed-use areas	Improving land management	Agroforestry	
Farmlands and mixed-use areas	Improving land management	Permaculture	
Farmlands and mixed-use areas	Improving land management	Organic farming	
Farmlands and mixed-use areas	Improving land management	Other	
Farmlands and mixed-use areas	Artificial regeneration	Growing perennial crops	
Farmlands and mixed-use areas	Artificial regeneration	Conservation tillage	
Farmlands and mixed-use areas	Artificial regeneration	Crop rotation	
Farmlands and mixed-use areas	Artificial regeneration	Integrated manure systems	
Farmlands and mixed-use areas	Artificial regeneration	Inclusion of cover and companion crops	

Farmlands and mixed-use areas	Artificial regeneration	Creating mobile animal shelters to promote regenerative agriculture	
Farmlands and mixed-use areas	Artificial regeneration	Low external input agriculture (e.g. reduction of herbicides and pesticides) and livestock (good practices for biocides)	
Farmlands and mixed-use areas	Artificial regeneration	Soil conservation techniques	
Farmlands and mixed-use areas	Artificial regeneration	Grazing management including free range / lower densities	
Farmlands and mixed-use areas	Artificial regeneration	Implementation of nature positive agriculture e.g. ensuring % of forest cover on farms	
Farmlands and mixed-use areas	Artificial regeneration	Nutrient balancing	
Farmlands and mixed-use areas	Artificial regeneration	Crop diversification	
Farmlands and mixed-use areas	Artificial regeneration	Mixed crop, intercropping and animal farming	
Farmlands and mixed-use areas	Artificial regeneration	Mixed farming and forestry	

Farmlands and mixed-use areas	Artificial regeneration	Other (describe)	
Farmlands and mixed-use areas	Assisted natural regeneration	Facilitate and create habitat for pollinators (e.g. hedgerows, increasing availability of nesting spaces and materials)	
Farmlands and mixed-use areas	Assisted natural regeneration	Control of pests through habitat creation for natural predators	
Farmlands and mixed-use areas	Assisted natural regeneration	Other	
Farmlands and mixed-use areas	Establish / manage Woodlots		
Farmlands and mixed-use areas	Restore riparian zones		
Farmlands and mixed-use areas	Invasive/problematic species control		
Farmlands and mixed-use areas	Manage invasive native species (incl. diseases)		
Farmlands and mixed-use areas	Restore acequias and irrigation rafts		
Farmlands and mixed-use areas	Land / water protection	-	
Farmlands and mixed-use areas	Land / water protection	Create corridors	

Farmlands and mixed-use areas	Other (describe)		

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