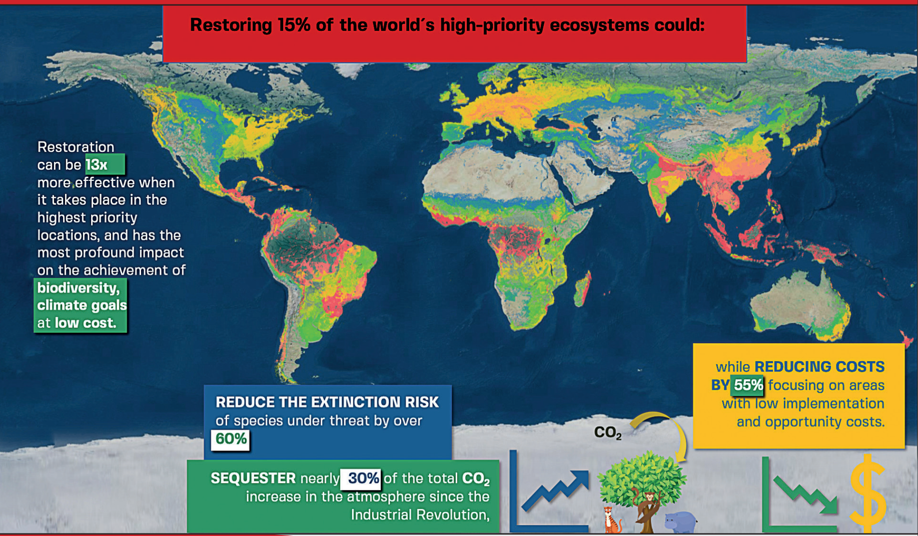
POST
BIODIVERSITY FRAMEWORK
EU SUPPORT
2020

TOWARDS POST-2020 EXPERTISE ON #23

INTEGRATED APPROACH: BETTER CHOICES FOR RESTORING ECOSYSTEMS



Bernardo B. N. Strassburg Carlos Alberto de M. Scaramuzza, Fernanda D. Gomes, Gabriela Teixeira. Duarte, Juliana M. de Almeida-Rocha, Joana Krieger, Renato Crouzeilles
International Institute for Sustainability, Brazil

If well-planned, ecosystem restoration can address environmental and socioeconomic aspects simultaneously. The biodiversity crisis and other major challenges of the coming decades — climate change, land and water degradation, and the transition towards the Sustainable Development Goals (SDGs) — are inextricably interconnected and can only be overcome with an integrated approach.

"A ROBUST RESTORATION PLAN IS VITAL FOR FINANCIAL RESOURCES MOBILIZATION AND SUCCESSFUL IMPLEMENTATION. IIS CONTRIBUTIONS FOR GENERATING MULTIPLE SCENARIOS OF PRIORITY AREAS FOR RESTORATION AND QUANTIFYING COSTS AND BENEFITS FOR EACH SCENARIO IS A CRITICAL INSTRUMENT FOR INVESTORS."
Adriana Moreira, PhD, Senior Biodiversity Specialist (GEF)

Ecological restoration of ecosystems as a nature-based solution [1] is central for improving the degraded ecosystem's health and the well-being of local communities by providing or upregulating nature contributions for people.

Scaling up these restoration actions to reverse the degradation of ecosystems worldwide is the challenge posed to the world by The United Nations Decade on Ecosystem Restoration (2021-2030), aiming to end poverty, combat climate change and prevent species' mass extinction.

The current draft of the new Global Biodiversity Framework (GBF) [2] to be decided in the next Convention on Biological Diversity (CBD)'s COP, the 15, contains a concrete aim related to restoration. Number 1 in the Action targets states that up to 50 % of land and sea areas should be globally under spatial planning. A yet to be defined percentage of degraded freshwater, marine, and terrestrial natural ecosystems should be restored. It is also crucial to repair the connectivity between these ecosystems as it is essential for biodiversity.

Restoration actions give people back cultural heritage and spiritual connections with nature. © Jack Charles

1. MORE FOR LESS: HOW RESTORATION BENEFITS COUNTERBALANCE ITS COSTS?

RESTORATION BENEFITS

Ecosystem restoration delivers multiple benefits for people and nature.

Socioeconomic and human health benefits include:

+ **Generation of jobs.** For every hectare restored by human intervention, direct jobs are created in activities such as seeds' collection and processing, seedlings' production and sale, plantations implementation and maintenance [3].
+ **Generation of income.** Restoration leverages sources of income in natural areas, such as ecotourism, sustainable use, and trade of timber and non-timber products in agroforestry models, fisheries. This alignment with sustainable practices not only adds value to restoration products but is also a prerequisite for any restoration initiative to safeguard ecosystems and species effectively.
+ **People's well-being and health.** Depollution and environmental recovery improve people's health, as many diseases - such as respiratory and mental health disorders - show environmental co-determinants [4].
+ **Protection of water resources.** Restoration of riverbanks and water springs protects water resources' quality by controlling erosion, minimising the silting risk of water bodies, and reducing eutrophication.
+ **Improved agriculture.** Plants' evapotranspiration increases air humidity and rainfall patterns, improving air quality and ensuring agricultural productivity. Crops that rely on natural pollination benefit if restoration occurs nearby or sparsely within croplands.

Environmental benefits include:

+ **Biodiversity conservation.** The chance of long-term species persistence can be increased by the quantity and quality of natural ecosystems, as well as landscape connectivity, thus decreasing the risk of species extinction.
+ **Climate change mitigation.** Restoration of degraded and/or converted ecosystems increases their capacity to absorb greenhouse gases from the atmosphere, storing carbon in vegetation, ocean waters, and soils [5].
+ **Adaptation to climate change.** Restoration improves the capacity of ecosystems to overcome and persist after extreme weather disturbances likely to occur in a changing global climate, such as extreme climate events, coastal disasters, rising temperatures, landslides, prolonged droughts, or intense floods [6] [7].

RESTORATION COSTS

Expenses in materials, services and human resources are necessary to implement restoration.

This implementation costs vary widely depending on:

+ **The level of human intervention required**, which in turn depends on the alteration degree of the vegetation and landscape structure, restoration goals, dispersal capacity of native species or favourable environmental and socioeconomic conditions.
+ **The cost of the restored ecosystems monitoring**, necessary to measure work's performance or/and identify additional intervention needs to reach intended benefits.

An economic approach to restoration should compare the long term opportunity cost to the benefits of the ecosystem restoration. Particular attention should be given to the alternative uses for the land in question at individual or common levels. It is worth considering that minimising land-use conflicts will help improve the willingness of different actors to engage in the restoration. The costs and liability of such restorations should be based on the polluter pays principle. Still, restoration benefits and costs vary greatly, and all would greatly benefit from a large scale analysis to allow maximum benefits and minimise costs in the future.

2. OPTIMISING OUTCOMES WHILE REDUCING COSTS

A spatial planning approach results in restoration actions with positive consequences on both adjacent or distant livelihoods and ecosystems [8]. A global study that prioritises restoration efforts [9] shows that restoration is up to thirteen times more effective in priority locations identified through a scientifically-based planning process than non-systematic planned restoration. This has an instrumental impact on the achievement of biodiversity, climate, and food security goals, at minimised costs. Spatial planning for restoration can also reduce adverse outcomes, while accounting for both benefits and costs simultaneously, providing a cost-effective solution [10] :

Area restored	Cost approach	Saving in cost	Environmental performance in % of maximum potential
15% worldwide	Minimizing cost only	55 % 1)	35% for biodiversity 40 % for climate
	Multiple benefits (biodiversity + climate mitigation + cost reduction)	25 % 2)	80% for climate 90 % for biodiversity

[1] IUCN defines 1 Nature-based Solutions (NbS) as "actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits".

[2] https://cutt.ly/MbPNxVP

[3] Crouzeilles R., Rodrigues R.R., Strassburg B.B.N (eds.) (2019). BPBES/IIS: Relatório Temático sobre Restauração de Paisagens e Ecossistemas. Editora Cubo, São Carlos p.77. https://cutt.ly/EcKZNXV

[4] Breed, M.F. et al. 2020. Ecosystem Restoration: A Public Health Intervention. EcoHealth. https://cutt.ly/WcKXQRu

[5] Expertise on #7 – Nature-Based Solutions: Harnessing The Potential For Ambitious Post-2020 Biodiversity Outcomes. https://cutt.ly/FbPMSex

[6] https://cutt.ly/6neBBHh

[7] Lavorel, S., Colloff, M.J., Mcintyre, S., Doherty, M.D., Murphy, H.T., Metcalfe, D.J., Dunlop, M., Williams, R.J., Wise, R.M. and Williams, K.J. (2015), Ecological mechanisms underpinning climate adaptation services. Glob Change Biol, 21: 12-31. https://cutt.ly/3cKVp7a

[8] Niemeyer, J. et al. 2020. Planning forest restoration within private land holdings with conservation co-benefits at the landscape scale. Science of The Total Environment, 717, 135262.

Intensifying agricultural activities, about 55% of all restorable lands globally could be rehabilitated without affecting food production. © Veronica Maioli

1) compared to a multiple benefits spatial planning approach

2) compared to a spatial planning approach focused only on change mitigation and biodiversity conservation

OPTIMISING BENEFITS

Scientifically-based (spatial) planning can optimise:
+ **Socioeconomic benefits**. To be achieved through several sustainable approaches, such as agroforestry and agroecology systems, integrated crop livestock forestry systems or good practices adoption, environmental certifications, and payment for environmental services (PES) schemes, among others.
+ **Biodiversity benefits.** Ecosystem restoration can save species from extinction by recovering their habitat. The decision as to where to restore influences the degree of contribution to biodiversity conservation. It also increases the integrity - or quality - and connectivity of nearby remaining habitat, scaling up its benefits for the biota. Restoring 15% of converted lands globally, as per Aichi Biodiversity Target 15, could reduce the species extinction risk by over 60% if concentrated in priority areas [10].
+ **Climate benefits.** Long-term benefits for climate change mitigation and adaptation relate to the type of ecosystem restored, the geographical region, and the environmental conditions in the restored area. Restoring 15% of converted land worldwide focusing on climate change mitigation could sequester over 300 gigatons of CO_2 - equivalent to approximately 30% of the total increase in atmospheric CO_2 since the Industrial Revolution [10].

MINIMISING COSTS

+ **Implementation costs.** Choosing the most appropriate restoration method by assessing the natural regeneration potential of a given area [9] can substantially reduce the implementation costs compared to active restoration [10].
+ **Opportunity costs.** Restoration's spatial planning based on the region's potentialities can be applied together with integrated landscape management approaches to avoid restoring areas with high opportunity costs, therefore optimising other land uses productivity and sustainability. A sustainable productivity increase could spare areas for restoration while maintaining or increasing overall food provision, as framed in the concept of 'land-neutral ecological restoration [11,12].
+ **Economic or social arrangements.** Large-scale restoration projects costs can be reduced by associating the restored ecosystems with sustainable economic or social uses. They can also be partly compensated with economic and political incentives such as PES programs [13], implemented worldwide at different scales [14,15,16].

3. KEY FACTORS FOR A SUCCESSFUL RESTORATION

One of the principles to achieve better benefits from restoration is to have an appropriate reference of the original ecosystem types as pointed out by the Society for Ecological Restoration in the International Principles and Standards for the Practice of Ecological Restoration [17] . From a landscape perspective, it is important to ensure that multiple types of ecosystems are covered in the planning, as their contribution to expected outcomes may vary. Hence, restoration is a flexible solution that should be planned according to local ecosystems' needs and features, keeping a balance among different ecosystem goals and ensuring representativeness.

Trade-offs between global targets (e.g., 20% of all restorable world areas), and/or national/subnational targets (e.g., 20% of all restorable areas within each country or region) can be understood by evaluating the implementation scenarios [10].

+ **Global targets** would identify priority areas to achieve maximum benefits, supporting international incentive schemes, such as REDD+. However, it could be unfeasible in practice if the top priority areas are located in specific regions (e.g., 96% of the Caribbean converted lands are in the top 15% of global priorities for biodiversity);
+ **National/subnational** targets would reduce by almost 30% potential benefits for biodiversity conservation and climate change, while increasing costs by more than 50% when compared to the unconstrained global equivalent. However, they are viable to implement for national/subnational governments, and they would increase the representation of ecological communities and provision of nature's contribution for people [10].

4. SUPPORTING THE DECISION-MAKING PROCESSES

Restoration planning provides information to support decision-makers and shall be enshrined in the goals of existing and upcoming international agreements, starting with the GBF. Its goals and milestones must translate to a net gain for natural ecosystems. The GBF needs to account for the conservation of important remaining sites for biodiversity, and help in restoring degraded natural areas, increasing ecosystems integrity and ecological outcomes such as human well-being. Furthermore, restoration calls for an integrated approach across multilateral environmental conventions – starting with the Rio's Conventions - and the SDGs.

[9] The potential of native species to spontaneously recolonize and establish the area, with none or little human intervention such as fencing and exotic species removal.

[10] Active restoration involves human interventions to promote native species colonization and establishment, such as soil improvement, development of seed banks, plantation of seedlings, enrichment, effective connectivity, among others.

[11] Strassburg, B. B. et al 2012. Increasing Agricultural Output While Avoiding Deforestation — A Case Study for Mato Grosso, Brazil. International Institute for Sustainability. https://cutt.ly/SbPNPPR

[12] Strassburg, B.B.N. et al. 2020. Global Priorities for Ecosystem Restoration. Nature. 586

[13] Payment for Environmental Services or PES is a strategy that connects beneficiaries of the ecosystem services provided by restoration to their providers (i.e.: landowners), who are compensated by the lost opportunity cost of other land-use practices.

[14] Gutiérrez Rodriguéz et al 2016. China's conversion of cropland to forest program: a systematic review of the environmental and socioeconomic effects. Environmental Evidence 5 (21). https://cutt.ly/IbO5xAO

Itatiaia, Rio de Janeiro State, Brazil © Liliane Seixas

1. Spatial planning needs strong and bold stakeholders' engagement. The impact of restoration is often limited by a lack of participation and buy-in from relevant stakeholders in the planning process. Successful adoption of this policy approach requires a trust-building process and national participations in Multilateral Environmental Agreements. It is a key enabling condition for implementing any restoration-related agreement and an initial step in a co-creation and co-development process of spatial planning, setting priorities and finding compromises on solutions.

2. Cooperation among actors is crucial. Restoration complexity requires strong communication and coordination efforts to reach its full potential. Common databases and indicators to evaluate and monitor the outcomes of the restoration plans are a right step to establish synergy. When defining restoration-related goals and actions, the indicators and baseline conditions should be clearly stated to ensure transparency and legitimacy of the results, and avoid undesirable outcomes.

3. Scientifically-based scenarios are critical to inform objective decisions. Scenarios allow decision-makers to explore and compare the possible outcomes of a decision at global, national, or local levels. They are a helpful benchmark, necessary to assess the plausibility of any restoration-related goal. They inform future discussions on the complementarity roles of different parties in achieving overarching targets and orientate funds' allocation for international incentive schemes such as REDD+.

4. Large-scale ecosystem restoration targets must be addressed with an integrated landscape management perspective to deliver their full socioeconomic and environmental impacts. Such recovery is complemented by the adoption of good practices in the other land uses in the territory through a robust participative planning process [18].

5. On a local scale, restoration planning supports financing discussions and mechanisms, bringing out the cost-benefits and solving local challenges related to ecosystem services and biodiversity issues. It also serves to encourage the transition to a sustainable and equitable future. Technology transfer, technical assistance and resources allocation to vulnerable communities is needed to implement restoration actions.

6. A robust restoration planning - that quantifies estimated costs and benefits for each scenario, identifying their trade-offs and synergies - reduces risk perception from potential investors, leveraging the financial resources necessary to implement the project. This blueprint raises substantial financial flows and irrigates blended finance solutions, putting together donations, concessional and regular loans, and direct social and ecological impact investments from the private sector.

7. Applying decision support platforms (DSP) - systems and tools offer customised insights for the restoration planning process at multiple scales. It generates successful and practical plans, targeted to optimise positive social outcomes to the most vulnerable. To fully contextualise restoration planning decisions, policymakers need to test the implications of different land uses, existing and planned protected areas, and other infrastructure. Only an integrated planning and management of restoration underscores the synergies and trade-offs between the different objectives.

It requires the involvement of multiple parties - from local community members to world leaders, national and international agencies, scientists, civil society, and the private sector - to be effective. Adopting this approach correctly identifies the socio-environmental, cultural, and economic demands and potentialities of the region of interest, revealing the opportunities for ecosystem restoration, thus maximising positive outcomes and minimising conflicts. As an example of DSP, IIS's PLANGEA[19] allows access, download and visualisation of conservation results and/or restoration scenarios at different scales, including maps, costs and quantitative estimates of benefits for biodiversity conservation and climate change mitigation.

"GOOD SCIENCE IS CRUCIAL TO DESIGN PLAUSIBLE AND EFFECTIVE TARGETS FOR ECOSYSTEM RESTORATION UNDER THE CBD, TO SUPPORT NATIONAL AND LOCAL DECISION MAKING AND IMPLEMENTATION OF THE UN DECADE OF ECOSYSTEM RESTORATION." H. DAVID COOPER, DEPUTY EXECUTIVE SECRETARY, CONVENTION ON BIOLOGICAL DIVERSITY" H. David Cooper, Deputy Executive Secretary, Convention on Biological Diversity

[15] See Fonafifo (Fondo Nacional de Financiamiento Forestal (Fonafifo). 2020. Programa de Pago de Servicios Ambientales. https://cutt.ly/lbO58xK

[16] Ezzine-de-Blas D. et al. 2016. Global Patterns in the Implementation of Payments for Environmental Services. PLoS ONE 11(3): e0149847. https://cutt.ly/abO5KOE

[17] Gann G.D. et al. 2019. International principles and standards for the practice of ecological restoration. Second edition. Restoration Ecology S1-S46. https://cutt.ly/gbO5LBb

[18] Kutter, A. & Ulbert, V. 2009. The impact of the participative approach to land-use planning. Land Use, Land Cover and Soil Sciences-Volume III: Land Use Planning, 186.

[19] https://cutt.ly/gbO5Jwh

TOGETHER
CBD COP 15 ___ KUNMING 2021
TOWARDS A GLOBAL DEAL FOR NATURE & PEOPLE

4POST2020BD.NET
@4POST2020BD

POST2020 BIODIVERSITY FRAMEWORK – EU SUPPORT IS FUNDED BY THE EUROPEAN UNION AND IMPLEMENTED BY EXPERTISE FRANCE. IT AIMS AT FACILITATING A COMPREHENSIVE AND PARTICIPATORY PROCESS LEADING TO THE ADOPTION OF AN AMBITIOUS POST-2020 GLOBAL BIODIVERSITY FRAMEWORK THAT FOSTERS COMMITMENT AND IMPLEMENTATION.

IN PARTNERSHIP WITH

THIS PROJECT IS FUNDED BY THE EUROPEAN UNION

IMPLEMENTED BY EXPERTISE FRANCE

BRANDING & DESIGN © ADDB.FR