

The United Nations Decade on Ecosystem Restoration

Strategy

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Executive Summary: The UN Decade on Ecosystem Restoration

This strategy is the result of a global, open and inclusive consultation process in 2019 and 2020. It will be adapted periodically and will guide the implementation of the UN Decade by all stakeholders in a spirit of partnership, inclusiveness and joint coordinated action.

The 2030 Agenda for Sustainable Development seeks to end poverty, conserve biodiversity, combat climate change and improve livelihoods for everyone, everywhere. These objectives, encapsulated in 17 Sustainable Development Goals (SDGs) are unlikely to be met unless ecosystem degradation is stopped and ecosystem restoration is undertaken at the immense scale of hundreds of millions of hectares globally. Currently, there is insufficient political support and technical capacity in both the public and private sectors to invest in the many hundreds of thousands of ecosystem restoration initiatives worldwide that are needed to achieve restoration at such a scale. Not only would such investment contribute to achieving the SDGs, but it would also yield considerable economic returns for a recovery from the COVID-19 crisis and lead to more social, economic and ecological resilience. Based on data from a wide range of ecosystems, for every dollar spent on restoration, between three and seventy-five dollars of economic benefits from ecosystem goods and services can be expected. UN Member States decided to implement a Decade on Ecosystem Restoration to realise these benefits and to ensure that healthy ecosystems play a critical role towards achieving the SDGs by 2030. This UN Decade will inspire and support governments, UN agencies, NGOs, civil society, children and youth, private sector companies, indigenous peoples, farmers, women's groups, local communities and individuals globally to collaborate and develop the appropriate skillsets for catalysing and successfully implementing restoration initiatives across the world. The support will include: promoting a global movement focussing on restoration; developing legislative and policy frameworks to incentivise restoration; developing innovative financing mechanisms to fund operations on the ground; detailing a values-based imperative to conserve, restore and care for nature; undertaking social and natural science research on restoration in terrestrial, freshwater, estuarine as well as marine environments; monitoring global progress on restoration; and building the technical capacity of restoration practitioners globally. Although the UN Decade ends in 2030, it aims to create a platform for societies globally to put their relationships with nature on a new trajectory for centuries to come. It is envisaged that this trajectory will include: nature being respected across society; ecosystem restoration taking place over hundreds of millions of hectares and generating millions of new livelihoods; human rights, with a focus on gender equity, youth, local communities, indigenous peoples and future generations, being central to restoration initiatives; global supply chains and consumption patterns being shifted to protect, sustainably manage and restore nature; long-term scientific research being used to guide restoration initiatives; and the value of nature being a central pillar of national systems that assess economic well-being.



1. Introduction

a) Restoration, conservation and sustainable use of natural resources

1. On 1 March 2019, under Resolution 73/284, the United Nations General Assembly proclaimed 2021–2030 to be the United Nations Decade on Ecosystem Restoration (hereafter referred to as the UN Decade), with the primary aim being to *prevent, halt and reverse the degradation of ecosystems worldwide*. All initiatives within the UN Decade will consequently have a dual focus on protecting as well as restoring ecosystems. The local social, economic and ecological context of each initiative will determine the appropriate balance of conservation and restoration in a particular landscape. Integrated land-use planning, undertaken in a rights-based manner, where all stakeholders are informed of the full range of benefits to be gained through conservation, restoration and sustainable use of natural resources in their local ecosystems, assists in achieving this balance. Wherever the term restoration is used in the text below, it refers to this type of planning as well as subsequent actions in the ecosystems concerned.

2. In the context of the UN Decade, ecosystem restoration encompasses a wide continuum of activities that contribute to protecting intact ecosystems and repairing degraded ecosystems¹. Such activities include, for example, enhancing organic carbon in agricultural soils, increasing fish stocks in overfished zones, remediating polluted sites, restoring ecological processes, restoring biodiversity and conserving fauna and flora that can assist in the restoration process. The scale of these activities can range from a few hundred metres to thousands of kilometres, depending on the societal actors and ecosystems involved. Crucially, restoring ecosystems increases the supply and quality of ecosystem services over time towards desired outcomes supporting national sustainable development priorities. The resolution highlights that the numerous benefits accruing from this process can play a major role in achieving the objectives of the 2030 Agenda for Sustainable Development and its associated UN Decade of Action. These include; ending poverty, conserving biodiversity, combating climate change and improving livelihoods for everyone, everywhere. Indeed, efficient and sustainable ecosystem restoration, complemented by conservation of ecosystems, is uniquely able to make major contributions to all 17 Sustainable Development Goals (SDGs)² across the world's agricultural areas, and its mountains, forests, wetlands, coastlines and oceans. Ecosystem restoration will in particular support Life Below Water (SDG 14) and Life on Land (SDG 15) by enhancing the quality and area of habitats for wildlife. These habitat improvements will in turn help societies mitigate and adapt to climate change (SDG 13), improve the health of societies in rural and urban environments (SDGs 3, 11), and increase the supplies of clean water (SDG 6) and sustainable food (SDG 2, 12). Investments in restoration that adhere to principles of gender equality and restorative justice³ will also provide and improve: work opportunities and income streams (SDGs 1, 5, 8, 10, 16); and cross-sectoral collaboration, learning and innovation on the use of ecosystem goods and services (SDGs 4, 7, 9, 17). All of these effects will assist countries in resolving conflicts over natural resources and reduce the need for communities to migrate as a result of such conflicts. Lastly, and strongly aligned with 2030 Agenda, realising the human rights of all people, including for example the local communities and indigenous peoples living in many of the ecosystems requiring conservation and restoration, will be central to all activities of the UN Decade.

3. The UN Decade is also well positioned to assist in the world's economic recovery from the COVID-19 pandemic. Investments into large-scale ecosystem restoration have been documented to generate more livelihoods per dollar spent than other sectors, such as transportation and building infrastructure whilst also yielding attractive long-term economic returns⁴. A critical role of the UN Decade will consequently be to highlight to decision-makers the

1 Gann et al. 2019. International principles and standards for the practice of ecological restoration. Second edition. Restoration Ecology DOI:10.1111/rec.13035. See <https://www.ser.org/page/SERStandards/International-Standards-for-the-Practice-of-Ecological-Restoration.htm> 'Degraded ecosystems' refers to terrestrial, freshwater and marine systems that have been converted or altered, including in agricultural landscapes and urban environments. 'Repair' encompasses processes and biotic/abiotic components.

2 IRP. 2019. Land Restoration for Achieving the Sustainable Development Goals. An International Resource Panel Think Piece. United Nations Environment Programme, Nairobi, Kenya IPBES Land degradation assessment collaboration. 2018. The IPBES assessment report on land degradation and restoration. Bonn: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). Available at: <https://www.ipbes.net/assessment-reports/ldr> IPCC. 2019. Climate Change and Land. An IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems.

3 Hill, G., Kolmes, S., Humphreys, M., McLain, R. and Jones, E.T. 2019. Using decision support tools in multi-stakeholder environmental planning: restorative justice and subbasin planning in the Columbia River Basin. Journal of Environmental Studies and Sciences 9, 170–186. Available at: <https://link.springer.com/article/10.1007/s13412-019-00548-x>

4 BenDor, T., Lester, T.W., Livengood, A., Davis, A. and Yonavjak, L. 2015. Estimating the size and impact of the ecological restoration economy. PLoS one 10, e0128339. Available at: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0128339> BenDor, T.K., Livengood, A., Lester, T.W., Davis, A. and Yonavjak, L. 2015. Defining and evaluating the ecological restoration economy. Restoration Ecology 23, 209–219. Available at: <https://onlinelibrary.wiley.com/doi/abs/10.1111/rec.12206> Nielsen-Pincus, M. and Moseley, C. 2013. The economic and employment impacts of forest and watershed restoration. Restoration Ecology 21, 207–214. Available at: <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1526-100X.2012.00885.x>

job-creation and income-generating opportunities that ecosystem restoration presents and to detail how to take advantage of these opportunities.

Role of the UN Member States

4. UN Member States committed in the resolution to support the UN Decade by building a new momentum for ecosystem restoration globally, scaling up existing ecosystem restoration efforts, raising awareness of the importance of conservation and restoration, and building synergies between agriculture, urban development, ecosystem conservation and restoration initiatives. With this support, the UN Decade is expected to contribute to the SDGs in addition to the goals of the Paris Agreement adopted under the United Nations Framework Convention on Climate Change (UNFCCC), the Land Degradation Neutrality targets supported by the United Nations Convention to Combat Desertification (UNCCD), the goals of the post-2020 global biodiversity framework under the Convention on Biological Diversity (CBD), and the Bonn Challenge's target of restoring 350 million hectares of degraded land. The goals of other international agreements relevant to conservation and restoration of ecosystems will also be supported by these activities, including for example the World Heritage Convention, the Ramsar Convention, the Convention on the Conservation of Migratory Species of Wild Animals, the UN Strategic Plan for Forests, the United Nations Convention on the Law of the Sea, REDD+ under the UN Framework Convention on Climate Change, Stockholm Convention on Persistent Organic Pollutants, and the Regional Seas Conventions. The UN Decade will furthermore complement the UN Decade of Ocean Science for Sustainable Development (2021–2030), the UN Decade of Family Farming (2019–2028) and the International Decade for Action on Water for Sustainable Development (2018–2028); and build on previous UN Decades such as the Decade on Biodiversity (2011–2020) and the UN Decade for Deserts and the Fight against Desertification (2010–2020). This will be done through coordination mechanisms established by the UN Decade's lead agencies (see section on Governance structures below).

5. The resolution requests that, in support of the UN Decade, Member States foster political will, mobilise resources, build capacities, mainstream ecosystem restoration into national policies and plans, implement plans to protect and restore ecosystems, and undertake collaborative scientific research. The strategic approach and suggested activities for the UN Decade were further developed over the period March 2019 to March 2020 through a process of consultation with governments, UN agencies, international and local NGOs, the private sector, academia, youth organisations, faith-based organisations and secretariats of the Rio Conventions. The consultations were conducted through engagements on the side of the Rio Convention meetings⁵ as well workshops, meetings and conference calls. This strategy document is based on information received during these consultations as well as from the ~2000 comments on the draft strategy (posted on the website of the UN Decade in March 2020) that were received from governments, non-governmental organisations, universities, research groups, civil society, indigenous peoples' groups, human rights groups, youth organisations and individuals. The purpose of the strategy is threefold: firstly to catalyse a new approach to national development, with ecosystem restoration being central to development planning and investment; secondly to promote broad and representative participation within restoration initiatives, including among indigenous peoples, farmers, grassroots organisations and traditional leadership; and thirdly to inspire stakeholders across the world to take actions to make the UN Decade a success, through both small- and large-scale restoration activities.

Kellon, C.P. and Hesselgrave, T. 2014. Oregon's restoration economy: how investing in natural assets benefits communities and the regional economy. SAPIENS: Surveys and Perspectives Integrating Environment and Society 7, 7.2. Available at: <https://journals.openedition.org/sapiens/1599>

5 >25 workshops/events focussing on the strategy for the Decade were held; >150 individuals were consulted in Skype calls or in-person meetings; and >50 organisations were engaged.



2. Vision and theory of change

a) A new trajectory for the 21st century

6. The overarching vision for the UN Decade is a world where – for the health and wellbeing of all life on Earth and that of future generations – the relationship between humans and nature has been restored, where the area of healthy ecosystems is increasing, and where ecosystem loss, fragmentation and degradation has been ended.

Underpinning this vision are three main goals:

- enhancing global, regional, national and local commitments and actions to prevent, halt and reverse the degradation of ecosystems;
- increasing our understanding of the multiple benefits of successful ecosystem restoration;
- applying this knowledge in our education systems and within all public and private sector decision-making.

By achieving these goals, the decade will be assisting societies globally to embark on a new ecological, economic and social trajectory through the rest of the 21st century and beyond. Planning for such a timeframe is necessary because ecosystem conservation and restoration planning is inherently long-term, spanning many human generations. For this reason, the UN Decade will work closely with partners that host platforms and programmes envisaged to continue beyond 2030.

7. The ecological aspect of the new trajectory for the 21st century will restore ecosystems to provide a host of goods and services for current generations. It will also serve to conserve biodiversity for its own sake and for the sake of future generations. The economic aspect of the trajectory will generate a new restoration economy that comprises investments in ecosystem restoration at the scale of hundreds of millions of hectares. Such restoration will create 10s of millions of new jobs, yield substantial economic returns on investment and assist the world to recover from the economic damage inflicted by the COVID-19 pandemic. Lastly, the social aspect of the trajectory will ensure the principles of human rights are fully and compassionately adhered to within the new restoration economy. All long-term decision-making on the use of natural resources (in urban, suburban, industrial, rural or marine environments) will be undertaken in a transparent, participatory manner, with all stakeholders fully informed about their rights and the benefits emanating from decisions to embark on long-term conservation and restoration of ecosystems. In landscapes where restoration is implemented, the economic benefits from restoration will need to be shared equitably, according to rights particularly with those segments of society previously marginalised on the basis of gender, race, age, nationality or economic status. Land tenure policies and the rights of indigenous peoples will be of critical importance given that many landscapes eligible for restoration are currently used by indigenous peoples without land tenure security.

b) Barriers

8. To achieve the vision of the UN Decade and set the stage for a new trajectory for the relationship between humans and nature through the 21st century, stakeholders from across the world, representing all economic sectors, will need to collaborate and undertake myriad, diverse activities. The number of collaborative interactions and on-the-ground activities needed to upscale restoration activities to the point where they are having meaningful global impacts is too great for one initiative to directly orchestrate and manage. Consequently, the strategy aims to catalyse and support a peer-driven, participatory global movement that self-organises and self-orchestrates in a decentralised manner, but which follows clear guiding principles on appropriate ecosystem protection and restoration activities.

9. The UN Decade will address six primary barriers to catalysing a global movement that promotes and implements large-scale restoration. These barriers relate to public awareness, political will, legislative and policy environments, technical capacity, finance and scientific research.

- Barrier 1 is the limited awareness across societies globally of the considerable negative effects that ecosystem

degradation is having on the well-being and livelihoods of billions of people^{6,7}, the costs of this degradation⁸, and the profound societal benefits that would accrue with major investments in ecosystem restoration⁹.

- Barrier 2 is that, despite the economic benefits that restoration investments would bring societies, the pressure on decision-makers in public and private sector to invest in long-term ecosystem restoration initiatives is relatively small compared with the pressures to invest in other sectors like health care, manufacturing, education and defence.
- Barrier 3 is the relative scarcity of legislation, policies, regulations, tax incentives and subsidies that incentivise a shift in investments towards large scale restoration and production systems, value chains and infrastructure that do not degrade ecosystems.
- Barrier 4 is the limited technical knowledge and capacity of national governments, local governments, local NGOs and private companies to design and implement large-scale restoration initiatives.
- Barrier 5 is the relatively small amount of finance that societies are making available for investing in large scale restoration because of the perceived and/or real risks involved in such investments.
- Lastly, Barrier 6 is the limited investment into long-term research, including social as well as natural sciences, that focusses on innovation to improve restoration protocols through time.

10. There are many other secondary barriers to achieving the vision of the UN Decade which will need to be addressed by the global movement of stakeholders ranging from local ecological, economic and social factors within specific landscapes to global geopolitical factors and economic forces influencing governments and inter-governmental organisations. Examples of the types of barriers that stakeholders are likely to encounter, which are frequently complex, inter-related and overlapping, are summarised in Annex 1. This annex will be expanded upon during the course of the decade, as stakeholders present additional barriers and their suggested approaches for managing the considerable ecological and socio-economic complexity associated with influencing the management of land and oceans over hundreds of millions of hectares globally¹⁰.

c) Pathways

11. The strategy of the UN Decade is to address the six primary barriers described above through a collaborative effort of all the stakeholders along three main pathways. Pathway I will generate the peer-driven, participatory global movement that focuses on upscaling restoration. Pathway II will foster political will so that leaders in the public and private sectors support the global movement and champion restoration. Pathway III will catalyse research and development that generates the technical capacity that is needed to restore ecosystems at scale. The theory of change, highlighting these pathways and barriers, is presented in Figure 1.

12. Pathway I, the generation of a global movement, based on a foundation of many linked local, regional and global networks and initiatives (see examples in Annex 3), will focus on raising awareness and changing how societies perceive the value of ecosystem restoration. This pathway seeks to increase the intent of societies worldwide to restore degraded landscapes on a large scale. It will showcase the economic value of restoration for local communities against the cost of inaction. Such restoration could be achieved through single investments in large areas of hundreds of thousands of hectares, or many smaller initiatives that, in total, combine to result in a considerable increase in the supply of ecosystem goods and services in a particular land or seascape. Pathway I aims to shift behaviours across society that result in ecosystem degradation and impede ecosystem restoration. These currently take place despite in-depth scientific knowledge on: the negative impacts of degradation on societal well-being; the diverse benefits of ecosystem restoration for current and future generations; and the required interventions for halting, preventing and reversing degradation.

6 IPBES Land degradation assessment collaboration. 2018. The IPBES assessment report on land degradation and restoration. Bonn: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). Available at: <https://www.ipbes.net/assessment-reports/ldr>

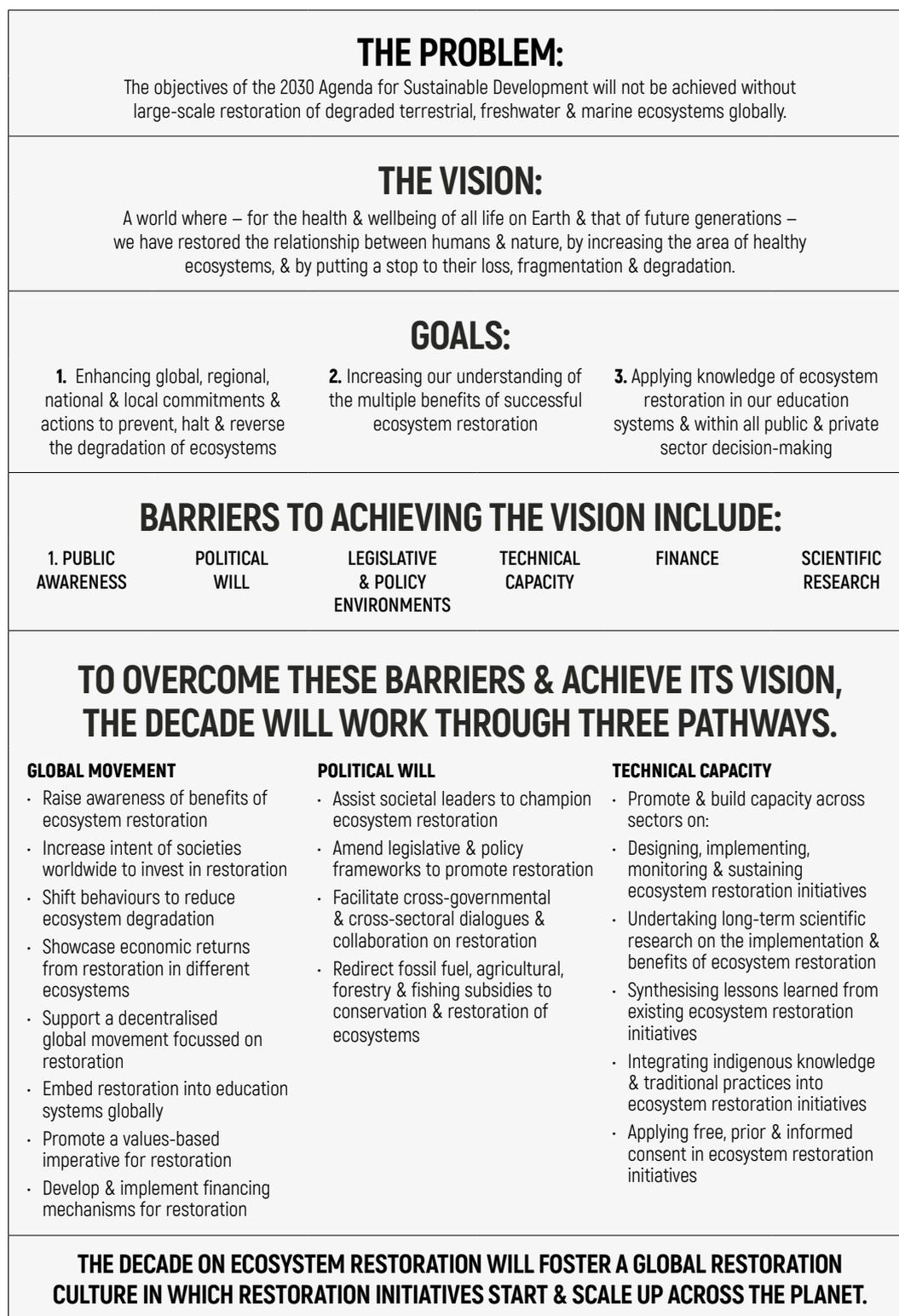
7 IPCC. 2018. Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. Available at: https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Full_Report_High_Res.pdf

8 The global costs of this degradation are extreme, with lost ecosystem service values being estimated to be USD 6.3–10.6 trillion a year. See ELD Initiative. 2015. The value of land: Prosperous lands and positive rewards through sustainable land management. Available from www.eld-initiative.org

9 The Economics of Ecosystems and Biodiversity. 2015. TEEB for Agriculture & Food: Towards a global study on the economics of eco-agri-food systems. Geneva: UN Environment. Available at: http://www.teebweb.org/wp-content/uploads/2013/08/Towards-TEEBAgFood_15May2015.pdf

10 This will include adopting a systems thinking approach to manage the non-linear and often unpredictable manner in which these factors interact. See e.g. Anand, M. and Desrochers, R.E. 2004. Quantification of restoration success using complex systems concepts and models. *Restoration Ecology* 12, 117–123. Available at: <http://www.uoguelph.ca/~manand/Papers/AnandEt04.pdf>

Figure 1. Theory of change for the UN Decade Ecosystem Restoration



13. A digital hub will be established by the core team of the UN Decade in Pathway I that provides the following: targeted calls to action for changing how society perceives the need for ecosystem restoration; flows of information among stakeholders from research, policy and practice; peer-to-peer learning and experience exchange; a platform for restoration practitioners (individuals, groups and communities, with a specific focus on indigenous peoples, farmers, women and youth) to connect with each other and with investors, the general public, and funders; compendiums of best practices in different ecosystems; guidance for increasing the resilience of restored ecosystems under

climate change¹¹, and a tracking of current and past ecosystem restoration initiatives across the world. Further actions within Pathway I relate to education, investments, divestments, business plans and value chains. UNESCO, together with other partners, will facilitate the inclusion of restoration into education at all levels (primary, secondary and tertiary) through its programme Education for Sustainable Development (ESD). Under the new 'ESD for 2030' framework, governments, schools, educators, young people, traditional leaders, and communities will be encouraged to incorporate ecosystem restoration into formal, non-formal and informal education, including in community education, for people of all ages. Investments into ecosystem restoration will be catalysed by working with the finance sector to develop financing mechanisms, including global and local impact funds, microfinance, credit lines in banks, payment incentive schemes, public private partnerships, state budget lines (national and sub-national), small grant facilities, green bonds, sustainable banking options for the general public, and official development assistance projects. Calls to action for divestment from projects that are degrading ecosystems will be detailed and disseminated on the digital hub. Bankable business plans and value chains that facilitate ecosystem restoration will also be developed and supported.

14. Pathway II, will assist *inter alia* heads of state, government ministers, directors of government departments, parliamentarians, business leaders and landowners to champion restoration in their respective countries. In this way, and building on the momentum of the global movement developed in Pathway I, political will for ecosystem restoration will be fostered. Ministries of finance and planning will in particular be engaged in Pathway II by the UN Decade partners and the core team to mainstream restoration into national budgets, development plans and their climate change strategies (including Nationally Determined Contributions). The potential for investments in ecosystem restoration to assist countries recover from the economic damage from the COVID-19 pandemic will be highlighted in these engagements, with details provided on the number of livelihoods created per million US dollars invested and the attractive economic returns. Another strong focus of this pathway will be for the UN Decade partners to work with government ministries and departments in the sectors of agriculture, environment, energy, mining, industry, infrastructure, tourism, economic development and disaster risk reduction to amend legislative, regulatory and policy frameworks in a way that halts fragmentation and degradation of ecosystems and catalyses large-scale ecosystem restoration.

15. Dialogues on ecosystem restoration will be stimulated by the core team of the UN Decade and its partners within Pathway II. These dialogues, which will focus on what interventions are necessary to embark on restoration within a particular country, will take place across sectors, within and across governments, with indigenous peoples, within local communities, and within the private sector. Subjects covered in these dialogues connecting grassroots organisations with national decision-makers will include *inter alia*: redirecting fossil fuel, agricultural, mining, forestry and fishing investments and subsidies to protect and restore ecosystems¹²; developing small businesses that promote conservation, restoration and sustainable use of ecosystems; establishing suitable tenure systems for terrestrial, freshwater and marine ecosystems; implementing restorative justice; adhering to human rights within ecosystem restoration initiatives; introducing legislation and policies for incentivising restoration investments; and incorporating data on ecosystem restoration into routine national accounting.

16. Pathway III, the building of technical capacity, will focus on providing the best available methods for designing, implementing, monitoring and sustaining ecosystem restoration initiatives to institutions involved in ecosystem restoration as well as individual restoration practitioners globally. The aim will be, using appropriate institutional mechanisms, to increase the upscaling of ecosystem restoration globally by strengthening the role of science, indigenous knowledge and traditional practices and applying best technical knowledge and practice. A wide range of disciplines will be engaged by the decade's partners and the core team to overcome socio-economic and ecological barriers currently constraining such upscaling (see Annex 2 for examples of such barriers). Existing tools for monitoring and evaluating, conducting baseline studies, verifying data, undertaking primary research, implementing multi-stakeholder landscape governance and developing site specific ecosystem restoration protocols will be disseminated via the digital hub of the UN Decade. Capacity building on upscaling ecosystem restoration will also be conducted, by partners, for a wide range of stakeholders including *inter alia*: restoration practitioners; land users; rights-holders; politicians; schoolteachers; university lecturers; researchers; indigenous peoples; farmers; women's groups; local community trainers; government officials; and youth.

11 such that the interacting systems of people and nature can be best managed to deal with and adapt to sudden disturbances, uncertainty and change. See e.g. Schoon, M. and Van der Leeuw, S. 2015. The shift toward social-ecological systems perspectives: insights into the human-nature relationship. *Natures Sciences Sociétés* 23, 166–174. Available at: <https://www.cairn.info/journal-natures-sciences-societes-2015-2-page-166.htm>

12 The Decade, like the 2030 Agenda for Sustainable Development, will be implemented in a manner that is consistent with the rights and obligations of states under international law. It is noted that although investments and subsidies are invariably national decisions, their impacts can have global effects that jeopardise the achievement of the SDGs. The effects of investments and subsidies on ecosystems in the context of the Decade therefore warrant scrutiny and discussion on international, regional and national stages.



3. Implementation

17. The UN Decade will have two layers of implementation. The first layer comprises the activities undertaken by the decade's core team and partner organisations to catalyse and support a global movement that starts and scales up restoration initiatives globally. UNEP and FAO, as the lead implementing UN agencies of the UN Decade, will establish a core team which will focus on: developing the digital hub; disseminating information; building synergies within restoration initiatives by connecting stakeholders; promoting cross-sectoral dialogues, including with societal leaders, influencers and decision-makers; collecting and analysing information on lessons learned from restoration initiatives; developing financial instruments for restoration; working with partner organisations to promote the synergies between ecosystem restoration and the SDGs; establishing coordination mechanisms with the secretariats of the three Rio Conventions as well as other relevant UN conventions and UN Decades; and monitoring and evaluation of restoration initiatives globally. The size of the core team will be dependent on the availability of funding. Given the limited size and global scope of the team it will not be involved in direct implementation of restoration. Its role will rather be catalytic, facilitating collaboration amongst the global movement of diverse stakeholders, leveraging funding, and providing information to enable the stakeholders to undertake their own activities that contribute to the overall vision of the UN Decade.

18. Self-orchestrated activities by the UN Decade stakeholders are the second layer of implementation and will be the primary way in which a global restoration economy is built and a new trajectory for the relationship between humans and nature is forged for the 21st century. Annex 2 presents an overview of the activities proposed by stakeholders during the development of the strategy of The UN Decade. A communication strategy will provide details on how partners will be engaged by the core team. During the implementation of 'The UN Decade', the activities listed in Annex 2 will be further developed, with roles and responsibilities collaboratively defined and presented within an implementation plan. Importantly, all activities promoted through 'The UN Decade' will be in accordance with national priorities. The diverse array of stakeholders expected to be involved in the activities in the second layer of implementation include UN organisations, resource partners, governments (operating at national, subnational and local levels), conservation and other NGOs, private sector companies, academic institutions, civil society, schools, women's groups, faith groups, indigenous peoples' groups, youth organisations, farmer groups, land user associations, rights-holder organisations as well as millions of individuals operating outside of formal organisations.

19. During the consultations on the UN Decade, a wide range of UN agencies, resource partners and multi-lateral development banks expressed their strong commitment to contributing substantially to its vision by starting new initiatives or including existing initiatives under its umbrella. These organisations include, for example, the Rio Convention Secretariats, the Regional Seas Convention Secretariats, IUCN, UNESCO, the Global Landscapes Forum, the World Economic Forum, the World Bank, the World Resources Institute, and UNDP. In addition to leading a core team, UNEP and FAO will align their existing and future ecosystem restoration activities with that of the UN Decade. Considerable interest has also been expressed by the private sector in supporting the objectives of The UN Decade.

20. Many of the activities within the UN Decade will be building on prior and existing initiatives, such as the Bonn Challenge and the regional initiatives that inspired. An important role of the core team will be to assist stakeholders in identifying such initiatives and supporting their expansion in ways that optimise resource use and prevent duplication. Development of new initiatives, taking the lessons learned from existing initiatives, will also be a strong focus. All initiatives seeking to contribute to the vision of the UN Decade will be welcomed as contributing initiatives. It is expected that indigenous peoples, women's groups, farmers and local communities will feature across a large percentage of the initiatives operating under the banner of the UN Decade. Partners will be encouraged to seek the involvement of such groups given their important role in managing a large proportion of the world's ecosystems. The core team will provide the necessary tools and information to facilitate such engagement.

21. Sections 3a-c below provide an overview of how the three pathways of the UN Decade will be implemented and provide examples of existing initiatives that can provide lessons learned and could be replicated or upscaled. Additional initiatives that have activities anticipated to be relevant to and which were highlighted by stakeholders during the online review of the strategy are available in Annex 3. Stakeholders will be encouraged to review the annex and build on it to ensure that no relevant initiatives are omitted.

a) Pathway I: building a global movement

Facilitating collaboration

22. The core team of the UN Decade will seek to develop a global movement of organisations and individuals that collaborate to catalyse ecosystem restoration. Importantly, a proportion of the people engaged in protecting ecosystems and restoring them have limited or no internet connectivity, limited access to mobile phone networks and in some areas limited access to radio. It is consequently of critical importance that decade partners and the core team develop systems for effective and appropriate collaboration with such groups of people. These people include, for example, indigenous peoples living in remote ecosystems and poor communities living in rural agricultural landscapes. This will require innovation from a wide range of stakeholders; each landscape will require a context-specific plan developed in a participatory manner by local stakeholders, in collaboration with national and global stakeholders. Although the details of such plans will only emerge once such collaboration takes place, the overarching principles that will guide the development of the plans are well known. These include for example: human rights; restorative justice achieved through dialogue, participation and accountability; recognizing that cultural and natural heritage is perceived and defined by the owners and originators of that heritage; free, prior and informed consent for any change in land use; inclusion of indigenous peoples, farmers and local communities at all stages of planning and implementation; and ensuring that the benefits generated through a local restoration economy are equitably distributed to those previously marginalised on the basis of gender, race, age, nationality or economic status.

23. In addition to working with people who are not routinely connected to the internet, mobile phone networks or radio, partners and core team will seek to use the power of digital tools and social media to develop a global movement of organisations and individuals that collaborate on catalysing ecosystem restoration. This movement will magnify and build upon existing movements and initiatives focussing on conservation and restoration of ecosystems. Taking the lessons learned from many successful global movements in recent times, the movement will be developed in a peer-driven, informal manner with a strong focus on participation, transparency, channelling of information, intense collaboration and a networked approach to governance and decision-making¹³. Activities of the movement will need to be decided upon and implemented by the movement's members after the fundamental aims, objectives and *modus operandi* of the movement have been agreed upon in a networked manner. It is anticipated that the ultimate impact of the movement, like other successful global movements, will be exceptionally powerful because it will operate in a spontaneous, autonomous, decentralised manner and one that can scale up rapidly. It is this type of new power and scaling that is needed for achieving the restoration of hundreds of millions of hectares of degraded land and seascapes across the world.

24. Actions by the core team and decade partners within Pathway I to develop a global movement include *inter alia* developing a digital hub, generating and sharing information, fund-raising, developing calls to action, hosting dialogues and inspiring people from across all economic sectors to advocate for widespread ecosystem restoration. Websites and apps (e.g. Facebook, Twitter and Instagram) will facilitate rapid dissemination of information within the global movement, from a wide range of sources, including researchers, ecosystem restoration practitioners, indigenous peoples, women, youth, farmers and the general public. Webinars will be used to build capacity on specific technical topics, such as restoration protocols in different ecosystems, and learn from stakeholders' on-the-ground experiences, whilst the digital hub will provide a repository of easily searched and categorised information on how to design, implement and sustain ecosystem restoration in different ecosystems. The digital hub will seek to connect all existing relevant initiatives and hubs, acting as an umbrella where feasible. It will also showcase ecosystem restoration initiatives, developed and implemented by local organisations, enabling them to be recognised on the international stage. In so doing, the UN Decade will elevate the prominence of such initiatives among local decision-makers and communities by demonstrating how local activities are generating environmental, social and economic benefits which link into global objectives, such as the SDGs.

25. In addition to catalysing major investments into ecosystem restoration from the public and private sector, the 'calls to action' from the core team will seek to solicit private sector commitments and catalyse local activities coordinated by volunteers (individuals and organisations) in a peer-driven manner. The core team will provide the tools to assist such initiatives connect with local government, local businesses, potential investors and experienced restoration practitioners. The motivations for volunteers to dedicate time to advance the overarching vision of the UN Decade will vary, but they are expected to be grounded in the mindset that upscaling ecosystem restoration is an essential activity for societies globally to address climate change (through both mitigation and adaptation), halt

¹³ See e.g. Heimans, J. & Timms, H. 2018. *New Power: How It's Changing the 21st Century - and Why You Need to Know*. Macmillan Publishers Limited, New York.

biodiversity loss and to safeguard the well-being, human rights and livelihoods of current as well as future generations. The core team and partners will provide technical support via the digital hub to link volunteers to localised activities and to assist them in facilitating and coordinating such activities. Examples of such activities include: restoring local native ecosystems; implementing agro-ecological farming; establishing ecosystem restoration plots in local parks, schools and universities; posting podcasts online; painting murals; holding talks in community halls; conducting citizen science in restored ecosystems; forming local NGOs and companies that focus on ecosystem restoration; and leading hikes and field trips to explore the restoration potential of a particular landscape.

26. The digital hub will also be used to showcase activities as well as platforms that have regional or global application. Examples include: smartphone applications that generate data on the achievements of ecosystem restoration and link restoration practitioners to investors as well as buyers of the ecosystem goods and services; development of modules in video games that feature ecosystem restoration (and encourage gamers to also connect with nature outside of the digital world); development of school lessons on ecosystem restoration for teachers to integrate into curricula; facilitation of dialogues between stakeholders in different sectors – such as agriculture, water, energy, finance, infrastructure, development and conservation – to reach consensus on how to develop land use plans that maximise ecosystem restoration benefits for society; showcasing of bankable business plans; and connecting of investors and implementers in ecosystem restoration.

27. Youth organisations will be particularly instrumental in catalysing and maintaining a global movement given their presence at a local level, and their strong role in social media trends and activities. The involvement of youth in the UN Decade is critically important not only for the sustainability of restoration initiatives designed to last beyond the 21st century, but also for promoting intergenerational equity. The digital hub will consequently have sections for youth in which: learning materials on ecosystem restoration, tailored for different age groups and education levels, are provided; the perspectives and experiences of youth on restoration are published; youth champions leading restoration initiatives are showcased; and opportunities for raising finance for restoration by youths are presented. To foster organic support for The UN Decade among as wide a youth audience as possible, partnerships will be developed with social media organisations and influencers across a diversity of communities and platforms. Such partnerships will facilitate the empowerment and inclusion of youth in the ensuing global movement, as well as all other restoration initiatives under the umbrella of the UN Decade.

Developing a values-based restoration imperative

28. Societal decisions that have major repercussions for the well-being of current and future generations are not made solely on scientific and economic grounds. Other factors relating to beliefs, habits and aesthetics are of fundamental importance. The core team and partners of the UN Decade will consequently facilitate collaboration amongst a wide range of opinion-makers – including indigenous and traditional leaders, cultural icons, religious leaders, scientists, philosophers, artists, musicians, farmers, poets, comedians, influencers, content creators and other thought leaders – to encourage the development of a values-based imperative for managing ecosystems and economies globally. This imperative is expected to complement existing belief systems and to focus on the positive effects of ecosystem conservation and restoration on the well-being of individuals globally (e.g. a rediscovered relationship with nature that results in improved livelihoods and health for current and future generations). It is also envisioned that the imperative will ultimately stand alongside other commonly accepted values and principles such as democratic governance, gender equity and human rights. Once societies fully adopt the principle that all individuals have the right to enjoy the benefits of healthy ecosystems in their local environments, major investments in ecosystem restoration are likely to become common rather than occasional.

29. The UN Decade has a strong existing platform to build upon with regards to promoting a values-based imperative. Indigenous, faith-based and cultural organizations are already playing a crucial role in promoting a culture of stewardship of nature and ecosystem restoration globally. Similarly, many governments are actively promoting cultural imperatives related to stewardship of nature, as evident in: the concept of Pachamama (a local name for Mother Nature in many indigenous Andean cultures), which features prominently in many national narratives across South America; the Law of the Rights of Mother Earth in Bolivia; the Te Urewera Act in New Zealand (which established a legal entity in perpetuity for protecting the intrinsic environmental and cultural value of the Te Urewera landscape); the concept of 'Mother Earth' being used extensively by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES); the Convention on Biological Diversity's 2050 vision on living in harmony with nature; the United Nations General Assembly dialogues on Harmony with Nature; and the use of the theme "Ecological Civilization: Building a Shared Future for All Life on Earth" for framing the 15th meeting of the Conference of the Parties to the Convention on Biological Diversity in 2021.

Engaging individuals

30. In addition to governments, UN agencies, international NGOs and large corporations, it is envisaged that local NGOs and businesses as well as hundreds of millions of individuals will help develop and take ownership of the initiatives, ideas and imperatives catalysed within the UN Decade. Individuals – from school children to the elderly – can contribute to fulfilling its vision through *inter alia* teaching, voting, funding, campaigning, raising awareness, collaborating, writing, painting, drawing, speaking, philosophising, analysing, planting, seeding or cultivating. The digital hub of the UN Decade or its alternative platforms will have sections dedicated to showcasing individual champions and awarding prizes for particularly outstanding contributions on ecosystem restoration.

Partnering with youth

31. Young people are agents of change. This is evident in how youth have mobilised in recent years to support action on climate change and nature-based solutions. Youth organisations across the world are already championing the UN Decade and encouraging their members to catalyse ecosystem restoration initiatives. For example, over the period September to December 2019, youth consultations on the UN Decade were held in 25 locations, across 19 countries and five continents. There was unanimous support in these consultations from the hundreds of youth representatives for upscaling ecosystem restoration particularly because of its considerable potential for climate change mitigation and adaptation as well as improving the well-being of current and future societies. Youth representatives anticipate the world's youth uniting around the UN Decade through: participation in decision-making at national and international levels; their influence on social media trends; the running of campaigns; designing online and offline training programmes; their roles as young researchers and young professionals in the restoration-oriented workforce; and undertaking on-the-ground ecosystem restoration initiatives in their local neighbourhoods. Importantly, the core team is committed to responding to concerns raised by youth, and ensuring that the burden of responsibility for managing ecosystems sustainably is not carried by them, but by society as a whole.

32. During the course of the UN Decade, the United Nations Major Group for Children and Youth, through its UN Environment Major Group for Children and Youth and SDG 2 Working Group, will help facilitate the engagement of youth advocates, youth-led restoration initiatives and a wide range of formal and informal youth groups. These groups will also present recommendations emerging from youth on how to catalyse the upscaling of restoration globally to governments worldwide.

Working with educators

33. Ensuring that ecosystem restoration features prominently in decision-making globally in the decades ahead will require educating children over the course of 2021 to 2030 on the benefits to be derived from ecosystem conservation, sustainable use and restoration. This objective aligns strongly with the UN Convention on the Rights of the Child, which stipulates that all children have a human right to be educated on respecting nature. Given the considerable influence of the United Nations and Member States on the content in school curricula, and the immense power of social media, the UN Decade provides the world with a unique opportunity to ensure that an entire generation of school children, who will be society's future decision-makers, fully understand the benefits derived from ecosystems and the need for ecosystem restoration. By focussing intently on school curricula and extra-curricular activities (including implementing restoration on school properties or nearby green spaces), this decade will enable children between the ages of six and eight years in 2021 to have received 10 years of education on ecosystem restoration by 2030. Careful design of lessons on ecosystem restoration for different age groups of children by the decade's partners will ensure that each year of education adds new layers to their understanding of scientific as well as traditional knowledge on ecosystem restoration, so that by the time they leave school, they are in a position to form sophisticated views on where and how society should allocate resources to restoration. While they are forming these views, they will also invariably be influencing the thinking and actions of their parents, which is an additional co-benefit of educating children on restoration. The social media hashtag #GenerationRestoration will, along with other trending hashtags, be used for encouraging school children to join this global movement.

34. The core team of the UN Decade will promote many diverse ways of educating not only children, but also adults, on ecology in general and the benefits of ecosystem restoration in particular. Firstly, international initiatives focusing on education (e.g. the Global Partnership for Education, the Global Education First Initiative, UNESCO's Associated Schools Network, the Higher Education Sustainability Initiative, UNESCO's Land Restoration Training Programme and other initiatives presented in Annex 3) will be encouraged to integrate ecosystem restoration into school and university curricula as well as extra-curricular activities. Second, ecosystem restoration will be integrated into adult education initiatives such as the FAO's Farmer Field School (which currently assists farmers to take appropriate land use decisions) and public policy training of government staff in Member States. Third, online education models such as the One UN Climate Change Learning Partnership (UN CC:Learn), the Global Forest Education Platform under the aegis of the Collaborative Partnership on Forests, online workshops held through the UN Decade of Ocean Science for Sustainable Development and the Family Farming Knowledge Platform within the UN Decade of Family Farming

will be used and adjusted by stakeholders. Lastly, international and local NGOs will be encouraged to assist schools and universities with practical ways to include ecosystem restoration into their day-to-day activities, both within the curricula and in extra-curricular activities. Examples, which are already underway in some cities globally, include: establishing ecosystem restoration plots in or near school grounds; and developing school lessons for teachers, to be held within the plots, which integrate ecosystem restoration into a wide range of subjects, including *inter alia* science, geography, literature, poetry, maths, business studies, economics, agriculture and journalism.

Showcasing flagships and champions

35. Existing ecosystem restoration initiatives around the world will be an important source of information for stakeholders. The barriers encountered as well as successes achieved in such initiatives will be systematically analysed and shared by partners, enabling new initiatives to optimise their approaches based on worldwide experiences. Examples of existing ecosystem restoration initiatives that can potentially provide guidance include: the Atlantic Forest in Brazil; coral reefs in *inter alia* Indonesia, the Caribbean, Australia, Red Sea and the USA; the Great Green Wall of the Sahel; the Loess Plateau in China; agricultural landscapes in Andhra Pradesh, India (in which soil quality is being restored); subtropical thicket in South Africa; wetlands in Louisiana, USA; shellfish beds in the USA, Europe and Australia; peatlands in Europe and Indonesia; pine forests in Mexico; mangroves in Vietnam; the Emscher River in Germany; marine and coastal restoration in Turkey; grasslands and savannas in Kenya; freshwater lakes in Canada; and many others.

36. The above examples represent a small fraction of the world's restoration initiatives which could provide critical information for guiding future upscaling of ecosystem restoration. It will not be feasible for the core team to work directly with all such initiatives and consequently several flagship initiatives will be selected for focussed engagement and further scaling up. Depending on the specific initiative, the core team's activities could include: commissioning studies to analyse lessons learned; facilitating cross-sectoral dialogues; developing funding mechanisms for upscaling of restoration; raising seed capital; and providing technical advisory support. Some of the UN Decade flagship initiatives might in time also receive funding through the decade's Multi-Partner Trust Fund. A wide range of criteria will be used for selecting flagship initiatives in a transparent, participatory manner. These could include, for example: government endorsement; activities that fall within the continuum of ecosystem restoration practices developed by the Society for Ecological Restoration¹⁴; frequent cross-sectoral dialogues amongst stakeholders; adherence to FPIC (free, prior and informed consent); rigorous environmental and social safeguards; and potential for significant upscaling. The Great Green Wall of the Sahel, an initiative comprising many linked restoration initiatives within 11 countries across ~8000 kilometres through deserts, savannas and forests, is an example of a potential flagship initiative that is likely to meet such conditions.

Laying post-2030 foundations

37. Notwithstanding the extreme importance of immediate action to mitigate a range of environmental crises globally, the long-term nature of ecosystem restoration necessitates a long-term vision for the UN Decade's initiatives beyond 2030, with mechanisms in place to ensure maintenance and upscaling through the course of the 21st century and beyond. The global movement supported under Pathway I will need to ultimately become trans-generational based on a new solidarity between generations over decades and even centuries. Assuming that the UN Decade's vision of restoring the relationship between humans and nature is achieved, and a new ecosystem restoration mindset is embraced during the course of the decade by communities at all levels, it is likely that the UN Decade's initiatives will be self-sustaining, will expand after 2030, and will indeed become trans-generational. In alignment with this vision of long-term transformational change, potential actions for maintaining specific initiatives beyond 2030 will be keenly sought out, implemented and adapted by the core team and partners throughout its course. An Implementation Plan detailing such actions will be collaboratively developed and presented online on the UN Decade's website.

b) Pathway II: generating political support

Engaging heads of state and other decision-makers

38. Heads of state, ministers of finance, ministers from a wide range of other government departments, and business leaders will be supported by the core team and partners to champion ecosystem restoration through, for example, changes to national accounting systems, fiscal policies, tenure systems and management of natural resources such as rangelands, forests, wetlands, estuaries and ocean fisheries. A wide range of initiatives and partners are well positioned to provide such support and to highlight the benefits of restoration investments for policymakers and private sector decision-makers with regards to economic returns, job creation, cultural benefits, aesthetics, carbon sequestration, water generation and disaster risk reduction. Initiatives like the United Nations

¹⁴ Gann et al. 2019. International principles and standards for the practice of ecological restoration. Second edition. Restoration Ecology DOI:10.1111/rec.13035

System of Environmental-Economic Accounting (SEEA), for example, advises governments on how to include data on agriculture, forestry, rangelands, fisheries, air emissions, energy, ecosystem health, material flows and water into their national accounting systems, and on how to use this data for holistic decision-making on the management of national natural resources. It is envisaged that, within the context of the UN Decade, SEEA will assist in elevating the profile of ecosystem restoration within societal decision-making and in tracking progress on ecosystem restoration initiatives both nationally and globally. Part of such progress will include adjusting tenure systems pertaining to natural resources. In this regard, the Committee on World Food Security (an international and intergovernmental platform which reports to the UN General Assembly) in 2012 endorsed the widely applied Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (VGGT). The UN Decade will seek to build on these guidelines by identifying opportunities for ecosystem restoration to work in tandem with the implementation of VGGT worldwide.

Convening cross-sectoral dialogues

39. A wide range of initiatives, networks and organisations (large and small) have platforms that could host cross-sectoral dialogues to catalyse ecosystem restoration. The UN Decade's core team will encourage partners to initiate such dialogues at a local, national and international scales, with a strong focus on lessons learned and methods for upscaling restoration. See Annex 2 for topics of potential dialogues and examples of platforms which could host them.

Unlocking and reorienting finance

40. The scale of investment in ecosystem restoration required for a substantial global impact is likely to exceed one trillion US dollars of public sector as well as private sector funds over the course of the UN Decade^{15,16}. To place this in perspective, global costs of fossil fuel and agricultural subsidies currently exceed several trillions of US dollars annually. Given the costs of ecosystem degradation and the scale of the benefits from ecosystem restoration¹⁷, investing one trillion US dollars in ecosystem restoration over the period of a decade is arguably prudent and realistic. Indeed, it is a relatively modest starting point (~0.1% of expected global GDP over the course of the decade¹⁸), with larger amounts expected to be allocated and reoriented once societies start to experience the expected returns on investments in ecosystem restoration¹⁹. Such allocations and reorientations (to be made predominantly by national and local governments and the private sector) would include not only direct investments into restoration of terrestrial and marine systems but also shifts in financial flows, subsidies and taxes towards sustainable production, trade and consumption of commercial goods and services.

41. Based on analyses of existing ecosystem restoration initiatives across a wide range of ecosystems, benefit to cost ratios of between three and 75 can be expected, depending on the ecosystem and local socio-economic context²⁰. If bankable business cases for restoration cannot be made using solely private sector finance, instruments and funds for blending public and private sector finance will need to be used by partners. Examples of such instruments and funds include water funds, public sector grant facilities (e.g. the Green Climate Fund and Global Environment Facility), green bonds, REDD+ mechanisms and development impact bonds. In addition to such mechanisms, market conditions for sustainable investments will also need to be created through changes in policies and market regulations.

15 Restoration of terrestrial and marine environments will need to cover many hundreds of millions of hectares to make a meaningful impact on the well-being of societies worldwide. The estimated cost for restoring 350 million hectares of only one terrestrial ecosystem, namely forest, is USD 837 billion to 1.2 trillion. It is therefore likely that costs for restoration of a wide range of ecosystems above and beyond the 350 million hectares of forest will exceed USD 1 trillion. These costs were reported in: NYDF Assessment Partners. 2019. Protecting and restoring forests: a story of large commitments yet limited progress. New York Declaration on Forests Five-Year Assessment Report. www.forestdeclaration.org

16 The total cost of fossil fuel subsidies globally, when taking externalities into account, is estimated to be USD 5.3 trillion per year. See Coody et al. 2015. How large are global energy subsidies? International Monetary Fund Working paper. <https://www.imf.org/en/Publications/WP/Issues/2016/12/31/How-Large-Are-Global-Energy-Subsidies-42940>. Total support to agriculture (including support to farmers, general services to the sector, and consumer subsidies) across a sample of 53 countries covered by the latest Organisation for Economic Co-operation and Development (OECD) Agricultural Policy Monitoring and Evaluation report was estimated to be USD 705 billion per year during 2016-2018. See OECD. 2019. Agricultural Policy Monitoring and Evaluation, OECD Publishing, Paris. <https://doi.org/10.1787/39bfe6f3-en>.

17 The costs of ecosystem degradation and benefits of ecosystem restoration are described in detail in reports such as the *Economics of Land Degradation* (<https://www.eld-initiative.org>), *Economics of Ecosystems and Biodiversity* (<http://www.teebweb.org>) and the *Assessment Report on Land Degradation and Restoration* (<https://ipbes.net>).

18 Based on a global GDP of USD 86 trillion in 2019, with 2% annual growth.

19 The FAO estimates that USD 4.8 trillion would be required to restore 2 billion hectares of land and in so doing achieve SDG Target 15.3 relating to land degradation neutrality. See FAO & Global Mechanism of the UNCCD. 2015. Sustainable financing for forest and landscape restoration: Opportunities, challenges and the way forward. Discussion paper. Rome.

20 TEEB (The Economics of Ecosystems & Biodiversity). 2009. TEEB Climate Issues Update. www.teebweb.org/media/2009/09/TEEB-Climate-Issues-Update.pdf

42. Numerous existing coalitions and forums are well positioned to assist governments to make 'fast and fair' changes to national investments, subsidy regimes, taxation regimes and the regulatory environment such that finance is made available for ecosystem restoration. The changes would be fair because they would reduce current unintended consequences (e.g. biodiversity loss, land degradation, climate change) and would strengthen the intended consequences (e.g. social cohesion, food security, resilience, building natural capital, job creation) of the subsidies, taxations and regulations. Such changes have the potential to catalyse ecosystem restoration on a vast scale of hundreds of millions of hectares. The UN Decade's core team will encourage a wide range of coalitions, forums, tools and companies to facilitate these changes and to catalyse public and/or private sector investments into restoration.

43. The private sector will also need to play a prominent role in the UN Decade. Large corporations, financial institutions, small businesses and individual entrepreneurs will, for example, be encouraged by the core team and partners to develop bankable business plans for restoration initiatives that take into account the full range of benefits expected over the long-term and adhere to rigorous social and environmental standards. In some landscapes such plans will only be achieved through blending the returns from public benefits (e.g. increased supplies of clean water, improved public health, carbon sequestration) with private income streams (e.g. increased revenues from tourism and agricultural operations). In these cases, public/private partnerships will need to be developed through intensive collaboration between the private sector and institutions such as ministries of finance and development banks. The core team and partners will facilitate such collaboration.

c) Pathway III: building technical capacity

Deploying science and technology in ecosystem restoration

44. The UN Decade's core team and partners will provide technical support to ecosystem restoration initiatives globally. This will include providing scientific guidance, undertaking research, assessing socio-economic and ecological impacts of restoration, deploying technology where feasible, and guiding policymakers on evidence-based best practices. Importantly, comprehensive assessments of local and indigenous knowledge as well as traditional practices are likely to be critical starting points for many restoration initiatives. Such local knowledge invariably assists in developing a wide range of protocols for ecosystem conservation and restoration in terrestrial and marine environments^{21, 22}. There are 1.3 billion people in this group of indigenous peoples and local communities; working with them to conserve and restore ecosystems globally is consequently of fundamental importance for achieving the UN Decade's vision.

45. Once designed and implemented, the efficiency and effectiveness of restoration plans and protocols need to be rigorously assessed and regularly adjusted using data from long-term research. This adaptive management approach by all stakeholders involved in restoration initiatives is critically important because local conditions invariably change through time as a result of *inter alia* climate change, fires, pests, diseases, arrival of exotic plants, storms, droughts, floods and increasing atmospheric carbon dioxide concentrations. The UN Decade's core team will encourage a wide range of organisations and networks to promote social and natural science research that *inter alia*: hones the plans and protocols for restoring specific ecosystems, taking into account future global changes such as climate change; collects and centralises data from restoration initiatives; quantifies benefits to society from ecosystem restoration; provides links between ecosystem restoration, conservation and sustainable development; informs government policies that link to ecosystem restoration; guides how to halt habitat fragmentation, enhance biodiversity, protect keystone species and restore wildlife corridors; applies a systems-thinking approach to the complex, non-linear relationships in socio-ecological systems; provides guidance on critical social matters such as rights recognition, community-based monitoring, transfer of inter-generational knowledge in local languages and inclusive participation of women and youth; and enhances the governance structures controlling the sustainable use of natural resources. In this regard, an FAO-led Task Force has been established to start the process of collating best practices on ecosystem restoration and to propose an action plan for scientific research and dissemination of knowledge over the course of the decade.

46. In terms of providing technical support to design, implement and sustain ecosystem restoration, a wide range of organisations, networks, and individual experts will assist the UN Decade's stakeholders to embark on ecosystem

21 Macqueen, D. and Mayers, J. 2020. Unseen foresters - an assessment of approaches for wider recognition and spread of sustainable forest management by local communities. WWF, Stockholm, Sweden. Available at: <https://pubs.iied.org/pdfs/G04468.pdf>.

22 Drew, J.A. 2005. Use of traditional ecological knowledge in marine conservation. *Conservation Biology*, 19, 1286–1293. DOI: 10.1111/j.1523-1739.2005.00158.x

restoration and scaling up existing efforts using the best available scientific knowledge. For example, the UN Decade's core team will encourage: universities and research institutions globally to provide expert knowledge on designing and implementing ecosystem restoration protocols; the One Planet network (formed to implement the 10-Year Framework of Programmes on Sustainable Consumption and Production and support the achievement of SDG 12) to provide guidance on how to decouple ecosystem degradation from economic growth and food production systems; the Global Partnership on Forest and Landscape Restoration (a global network of governments, NGOs, research institutes, local communities and individuals) to provide technical guidance on ecosystem restoration relating to SDG 15 Life on Land; the inter-agency mechanism, UN Water, to provide technical support on SDG 6 Clean Water and Sanitation; the consortium of NGOs, academia and private sector entities within the Marine Ecosystem Restoration in Changing European Seas to provide guidance on restoration of coastal and marine environments; networks such as Botanic Gardens Conservation International and the Ecological Restoration Alliance of Botanic Gardens to provide expert knowledge on propagation of indigenous plant species based on data from the hundreds of ecosystem restoration plots managed by their member organisations worldwide; the Society for Ecological Restoration to work with its members to provide the latest scientific results and research taking place on local, national and international ecosystem restoration initiatives across the world; the Global Peatlands Initiative to provide guidelines on how to restore peatlands and prevent their degradation; the Ramsar Convention on Wetlands to provide guidance on wetland restoration, including peatlands; the Endangered Landscapes Programme to share its experience on landscape restoration in Europe and associated research work; the International Indigenous Forum on Biodiversity to provide input on traditional protection and restoration methods used by indigenous peoples; and IUCN members to use the Restoration Opportunities Assessment Methodology for identifying ecosystem restoration opportunities at national, subnational and landscape scales. The UN Decade's stakeholders will also be encouraged to provide spatial data for planning and monitoring ecosystem restoration.

47. With regards to synthesising and disseminating lessons learned from prior experiences in ecosystem restoration, several initiatives are already underway. These include: the Restoration Resource Center project and resource databases (a compilation of ecosystem restoration projects, expertise and other resources worldwide, managed by the Society for Ecological Restoration); the Coral Restoration Database (a compilation of coral reef restoration projects from around the world, managed by the project Best Practice Coral Restoration for the Great Barrier Reef); the International Coral Reef Initiative (an informal partnership of governments, UN agencies, NGOs and the private sector); the EcoHealth Network (which increases awareness of the benefits of ecological restoration among the public and policymakers, particularly in the field of public health); the Global Wetland Outlook (a report by the Ramsar Convention on Wetlands on the status of wetlands globally); the Global Land Outlook (a communications platform of the UNCCD Secretariat); and the UNCCD's Knowledge Hub (which collates the best available scientific and technical knowledge on reversing land degradation). Such initiatives will be encouraged by the UN Decade's core team to provide not only information but also inspiration to ecosystem restoration practitioners wanting to embark on ecosystem restoration projects for the first time or for upscaling existing initiatives.

48. Notwithstanding the complexity and multi-faceted nature of ecosystem degradation (as outlined in Annex 1), dialogues on how to manage particularly prominent challenges, using the best available scientific evidence, will be facilitated by the UN Decade's core team and partners during the course of this decade. Such dialogues will examine: how demand for consumer goods globally can be met through sustainable use of natural resources by manufacturing as well as extractive industries; how lessons learned from existing restoration initiatives can provide ways for overcoming barriers for upscaling in other initiatives; how the resilience of intact and restored ecosystems to climate change can be built; how improved storage and distribution of food can significantly reduce the >4 billion tonnes of CO₂ emitted from ~1.3 billion tonnes of food that is wasted annually; and how food production systems can be altered to prevent the degradation of ecosystems globally. (For additional topics suggested by stakeholders for dialogue and action, please see Table 1 in Annex 2.)

d) Management arrangements

Governance structures

49. As the lead implementing agencies, the main roles of UNEP and FAO will be to: empower others to plan, implement and monitor ecosystem restoration; coordinate and promote the Decade; share knowledge, tools and lessons learned; forge partnerships with and between a wide range of stakeholders willing to contribute to the vision of the Decade; and report on the success of the Decade to the UN General Assembly as well as all stakeholders and donors. Reporting commitments will include *inter alia*: informing the Environment Management Group of the UN Decade's progress and plans; reporting to the eighty first session of the UN General Assembly; and producing an annual Update Report – focusing on the contribution of ecosystem restoration to the SDGs – for the information of the High-level Political Forum on Sustainable Development.

50. Subject to the availability of resources, a small joint core team will be established by UNEP and FAO to provide a central unit for coordinating the UN Decade's activities and managing all communications. The envisaged activities of the core team are described in the Implementation section above. The core team will be able to accept secondments from the UN Decade partners, in line with UN rules and regulations. A UN Decade coordinator will manage the core team. Further support to the UN Decade's core staff will be provided by volunteers for functions such as website management, translation services, communications, partnership curation and coordination of activities in specific regions or countries.

51. A Strategy Group (comprising senior UNEP and FAO representatives) and the UN Decade's core team will be provided with technical guidance from an Advisory Board. Themes covered by this board will include *inter alia*: monitoring; communications and knowledge management; science and best practice; and finance. Importantly, strong linkages between the Advisory Board, the UN Decade's core team, core partner organisations, the Rio Conventions and other relevant UN conventions will be established. For example, it is envisaged that the Advisory Board will include representatives and/or chairs from existing science boards within the Rio Conventions as well as representatives from indigenous peoples, local communities, civil society, youth, farmers, women's groups, restoration experts, core partner organisations as well as corporate partners. It is also envisaged that an informal coordination mechanism with the secretariats of the three Rio Conventions, other relevant UN conventions, as well as coordination units of other current relevant UN Decades, will be established.

52. In addition to the Advisory Board, Task Forces will be established, as appropriate, to ensure that cross-cutting themes, such as land tenure, gender, agriculture, human rights, indigenous peoples, youth, economic forces underpinning ecosystem degradation, and barriers to restoration investment are taken into account by the UN Decade's stakeholders as they implement their activities. The Task Forces will promote dialogues and develop materials on these cross-cutting themes as well as others presented in Annex 1 and 2. Based on the number of comments received on the draft strategy on the topic of finance and economics, it is envisaged, for example, that a Task Force will be established to develop guidance on how to: reorient subsidies towards ecosystem restoration in an appropriate manner; counter economic forces and vested interests that result in ecosystem degradation; and incentivise individual as well as corporate investors to co-invest in ecosystem restoration with public sector partners, even in environments where the benefits from restoration are predominantly public goods.

53. A Panel entitled 'Humans in Nature', comprising a multi-disciplinary team of opinion-makers involved in the implementation of ecosystem restoration, will also be established at the outset of the UN Decade. This Panel will be responsible for assisting the global movement in developing an appropriate values-based imperative to restore and care for ecosystems. It is envisaged that this imperative will provide not only inspiration for the global movement but also the platform of fundamental principles that should stand the test of time and enable the movement to continue its work beyond the UN Decade and for centuries ahead.

Funding

54. A major focus of the UN Decade will be to unlock and mobilise finance in the public and private sectors to upscale restoration. As noted in Section 3b above, one trillion US dollars is a conservative estimate of the amount of finance required to assist in addressing current environmental challenges through ecosystem restoration. Unlocking and mobilising this amount of finance will be achieved through many routes. Changes in government subsidy regimes, taxation systems, national budgets and local government budgets will be needed. Finance will need to be mobilised from international financial institutions, multi-lateral development banks, national development banks, commercial banks and micro-finance institutions. Other significant flows of funding will need to arise from impact investments, philanthropic capital, local community investments, landowner commitments and contributions from individuals. The UN Decade's digital hub will have a specific section dedicated to the provision of knowledge on how to finance ecosystem restoration and the building of capacity of stakeholders to raise such finance. A special Task Force will be established to focus solely on this theme.

55. Activities undertaken by the core team and core partners will be funded through a Multi-Partner Trust Fund (MPTF). The amount of funding available for the core team will have a substantial impact on the extent of activities that the UN Decade will be able to catalyse. Raising funding for this team is consequently a major priority for UNEP and FAO.

56. The MPTF is not designed to be a facility that finances all activities needed to implement the full strategy. It will rather encourage and support strategic interventions for catalysing upscaling of restoration by the UN Decade's stakeholders in an informed and coordinated manner. This will be achieved through three outcomes. Outcome 1 focuses on establishing a global movement and catalysing ecosystem restoration initiatives, political will, exchange of knowledge and cross-sectoral collaboration on ecosystem restoration. Outcome 2 will increase capacity and

capability in the private and public sectors and civil society for policy reform. These reforms will catalyse investments and increase access to resources, resulting in restoration actions on the ground and implementation within Flagship initiatives. Outcome 3 will document and share results through monitoring and reporting of biophysical and socio-economic elements of sustainable ecosystem restoration and influencing activities for ecosystem restoration. Examples of the activities to be supported by the fund include: the establishment and management of a digital hub to catalyse a global movement focussed on ecosystem restoration; the development of a pipeline of public and private sector ecosystem restoration projects; connecting investors with potentially bankable ecosystem restoration projects; knowledge management and capacity building to support the design and implementation of ecosystem restoration initiatives; convening global dialogues on policy reforms, market distortions, public private partnerships and fiscal incentives for ecosystem restoration; and monitoring and reporting on the success of the UN Decade. *Member States and other stakeholders in a position to provide financial resources for these activities are invited to contribute to this Multi-Partner Trust Fund.* The Fund will not accept contributions from private sector entities that generate their main revenue from the extraction or processing of fossil fuels. Coalitions such as the Climate Action 100+ (representing 370 investors with more than US\$35 trillion in assets under management) are also encouraged to work with the UN Decade to source financing for major upscaling of ecosystem restoration. In addition, the UN Decade will work closely with existing public funds such as the Land Degradation Neutrality Fund, which is co-promoted by the UNCCD and partners, to catalyze private sector investment in sustainable land management and ecosystem restoration. Lastly, the MPTF will encourage the emergence of new private sector investment funds focussed on ecosystem restoration.

Monitoring progress

57. Monitoring and reporting through the UN Decade will focus on supporting global, regional and national commitments relating to ecosystem restoration under one common global umbrella. By generating and sharing knowledge, and inspiration, the UN Decade will assist in moving all these commitments forward and assist in the monitoring of their progress, thereby making a major contribution to the SDGs. It will also, through UNEP, FAO and partners, aim to make information on progress easily visible and accessible to a wide audience, including through existing structures that use remote sensing and satellite imagery.

58. The Decade will not establish formal country monitoring and reporting, but will rather use and build on existing reporting systems within relevant international commitments, conventions and plans. These include, for example, the 2030 Agenda for Sustainable Development, the CBD post-2020 biodiversity framework, UNCCD SLM/LDN Targets, UNFCCC reporting on REDD+ results and the Global Stocktake for NDCs; the Ramsar Strategic Plan 2016–2024, the United Nations Strategic Plan for Forests 2017–2030, the Pan-African Action Agenda on Ecosystem Restoration for Increased Resilience, the New York Declaration of Forests, and the Bonn Challenge. Data relating to ecosystem restoration from these existing initiatives will be collated to track the Decade's progress, thereby minimising reporting requirements for Member States. An FAO-led Monitoring Task Force is currently assessing which data produced within existing frameworks are most suitable for presenting the progress of the Decade and how to fill current information gaps. A framework with indicators, reporting lines and timelines is under development. Data disaggregated by gender, age and socio-economic status will be used wherever feasible in the Decade's monitoring and reporting.

59. CBD post-2020 framework targets pertaining to ecosystem restoration will be of particular importance for the UN Decade's monitoring and reporting. Such targets will be adopted and supported by the UN Decade to ensure that there are strong synergies between the UN Decade and the CBD post-2020 framework. It is also envisaged that the 17 Sustainable Development Goals (SDGs) and the SDG indicators will feature prominently in the UN Decade's outreach, monitoring and reporting. This is firstly because ecosystem restoration is uniquely positioned as an intervention that can contribute to all the overarching objectives of the SDGs of ending poverty, conserving biodiversity, combatting climate change, and improving livelihoods globally, and secondly because the timeframe of the SDGs, like the UN Decade, extends to 2030. Targets within the SDGs that refer specifically to ecosystem restoration and which will be linked directly to the UN Decade's activities, include but are not limited to SDG 6: Clean Water and Sanitation, SDG 14: Life Below Water, and SDG 15: Life on Land. These targets include, for example: Target 6.6 on the protection and restoration of mountains, forests, wetlands, rivers, aquifers and lakes; Target 14.2 on the sustainable management, protection and restoration of marine and coastal ecosystems; Target 14.4 on the restoration of marine fish stocks; Target 15.1 on the conservation, sustainable use and restoration of terrestrial and inland freshwater ecosystems; Target 15.2 on the halting of deforestation and restoring of degraded forests; and Target 15.3 on achieving restoration of degraded soils and achieving land degradation-neutrality (LDN), as per the UNCCD's targets and objectives.

60. A joint evaluation of the UN Decade's progress will be undertaken in 2025 and 2028 by UNEP and FAO Evaluation Offices. These evaluations will be presented to the UNEP/FAO Strategy Group (which includes directors in each agency) and will be publicly available.



Annexes

1. **Barriers**
2. **Indicative activities and sub-activities**
3. **Initiatives, institutions, education programmes, policies and conventions highlighted by stakeholders in feedback received on the online draft strategy as particularly relevant for the Decade.**

Annex 1. Barriers

Public awareness and societal mindsets

1. A societal mindset refers to a set of assumptions, views and philosophies that influence how societies organise themselves, take decisions and set long-term goals. A wide variety of factors are currently preventing societies from developing mindsets that lead to ecosystem restoration being a central consideration within their long-term development planning. The main factors are described in brief below.

2. *Awareness of the impacts of degradation.* Most people globally are not aware of the full extent to which many different types of ecosystem degradation are negatively impacting the wealth of their society, their own well-being and their human right to safe, clean, healthy and sustainable ecosystems^{23, 24}. The global costs of this degradation are extreme, with lost ecosystem service values estimated to be US\$6.3–10.6 trillion a year²⁵. The general lack of awareness is partly because ecosystem services such as nutrient cycling, pollination and water provision are not taken into account in most market transactions in, for example, the agricultural sector²⁶. The physical disconnect between people living in cities and nature further contributes to this lack of awareness (highlighting the need for green spaces and ecosystem restoration within urban areas).

3. It is also not commonly understood that without investments in large-scale ecosystem restoration, the negative effects of degradation are likely to greatly increase and compromise the well-being of present as well as future generations. Linked to this is a general underappreciation of the benefits of investing in large-scale ecosystem restoration. Focussing solely on the economics, returns from investments in ecosystem restoration are exceptionally high for society at large: ~50 per cent for tropical forests, ~20 per cent for other forests, ~42 per cent for shrublands, and ~79 per cent for grasslands over a 40-year time period²⁷.

4. *Societal beliefs and behaviours.* Systems of knowledge and the ways in which a society understand its relationship with nature, and values (or undervalues) ecosystems, are deeply embedded in social and cultural behaviours, traditions, and belief systems. These knowledge systems influence how ecosystems are appreciated and to what extent their value is incorporated into decision-making at individual, household, local, national and international levels. The outcome is often that short-term, local outcomes are prioritised at the expense of long-term, global outcomes. Importantly, social science research shows that simply increasing awareness of the negative effects of degradation and long-term economic benefits of ecosystem restoration is not guaranteed to alter the way ecosystems are valued or change how decisions affecting ecosystems are made.

5. Decisions prioritising short-term, local outcomes may be because of: i) a lack of awareness of the long-term negative impacts; ii) entrenched behaviours (in some cases based on cultural and spiritual beliefs) that may have been sustainable prior to increased human populations and expansion/industrialisation of value chains; iii) poverty or short-term survival needs limiting alternative options, even when the long-term negative impacts are known and appreciated; and/or iv) real or perceived economic benefits of these activities and how society discounts their economic, environmental and social value.

6. *Simple and negative messaging.* The inherent complexities of how ecosystems function, how they are degraded, and how they can be restored makes effective communication challenging especially to a diverse audience. As a result, the messaging in this regard is often simplified, with the threats of degradation more prominent in the media

23 IPBES Land degradation assessment collaboration. 2018. The IPBES assessment report on land degradation and restoration. Bonn: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). Available at: <https://www.ipbes.net/assessment-reports/ldr>

24 IPCC. 2018. Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty.

25 ELD Initiative (2015). The value of land: Prosperous lands and positive rewards through sustainable land management. Available from www.eld-initiative.org.

26 The Economics of Ecosystems and Biodiversity. 2015. TEEB for Agriculture & Food: Towards a global study on the economics of eco-agri-food systems. Geneva: UN Environment. Available at: http://www.teebweb.org/wp-content/uploads/2013/08/Towards-TEEBAgFood_15May2015.pdf

27 Ibid

than the opportunities for ecosystem restoration. This, in turn, leads to reporting on global environmental concerns being predominantly negative and devoid of the hope provided by ecosystem restoration.

7. *Awareness of the drivers of degradation and their frequently diffuse nature.* Drivers of degradation in most ecosystems are usually both direct and indirect^{28,29}, with both types needing to be addressed to make meaningful progress on protection and restoration of ecosystems. Direct drivers, include natural events (e.g. earthquakes, volcanic eruptions, extreme weather events, droughts, tropical cyclones and floods), and anthropogenic activities (e.g. changes in land and ocean use, resource extraction, pollution of freshwater resources and oceans, introduction of invasive alien species and emission of greenhouse gases). Indirect drivers include societal values and behaviours such as demographic factors (e.g. human population dynamics), socio-cultural factors (e.g. social beliefs, inequalities, marginalisation of certain groups, value systems and consumption patterns), economic factors (e.g. environmental externalities not being priced into goods/services, energy/agricultural subsidies having major unintended negative impacts on ecosystems, and demands from natural resource based-livelihoods), technological factors (e.g. advances in industrial and agricultural technologies) or factors relating to institutions, governance, conflicts and epidemics.

8. It is usually difficult to pinpoint a moment in time and space where one action was responsible for ecosystem degradation that then impacted negatively on an individual's well-being, including their health and livelihood. Degradation, with its negative effects, is rather woven into the fabric of how societies function and interact globally. For example, demand for animal products and plant products on one continent can, in a diffuse manner, catalyse extensive degradation of grasslands, forests, and wetlands on another continent, whilst also contributing to global problems such as pollution of the atmosphere and world's oceans. Given the complexity and inherent uncertainties within such pathways of degradation, it is a communication challenge to explain in clear and precise terms to governments, corporations and individuals how their collective actions are causing degradation, and how the associated diffuse negative impacts have created a crisis threatening the well-being of billions of people. Similarly, it is difficult to communicate in simple terms why the diffuse forces of degradation need to be countered and why major investments into ecosystem restoration are necessary.

The linkages between communities producing and consuming food in different parts of the world are particularly important for restoration practitioners globally to identify and address. For example, there is a danger that local communities that clear land in intact ecosystems in order to produce food crops for export are perceived as causing the degradation of ecosystems and needing to take responsibility for the restoration of those ecosystems. Communicating the collective responsibility across supply chains is consequently of critical importance for the global restoration community.

9. *Abstract, generalised messaging.* It is difficult to generalise about how to restore degraded ecosystems and what the benefits of ecosystem restoration will be because these details can vary markedly across regions and landscapes. This often results in messaging on ecosystem restoration being abstract and at a scale too large to be readily appreciated, as opposed to being anchored to a specific place. The credibility and the digestibility of messages on ecosystem restoration for the general public tend to consequently be diminished.

10. *Lack of consensus on how to define ecosystem restoration.* The complexity of ecosystem restoration has prevented global organisations and governments reaching consensus on a definition of ecosystem restoration, what terminology to consistently use, and what scientific principles to adopt for restoring ecosystems effectively. This has prevented the global community mapping out a clear ecosystem restoration vision for the future, with detailed goals and targets for individual ecosystems. It has also prevented leaders working on different global challenges that would benefit substantially from large-scale ecosystem restoration initiatives (such as climate change, biodiversity, food security, water security, poverty and human health) speaking about the global ecosystem restoration opportunity in an integrated manner.

11. *Messaging not tailored for diverse audiences.* The cross-sectoral and multi-disciplinary nature of ecosystem restoration means that messaging needs to be tailored for a wide variety of audiences, spanning different age groups, genders, professions, cultures, languages and livelihoods. A common approach for organisations working on ecosystem restoration is, however, to present the messages in a manner that is easily absorbed by people with a background and strong interest in ecosystem restoration, as opposed to a manner that would resonate with, for example, rural subsistence farmers, or staff within ministries of finance. Reasons for this include for example insufficient resources for generating the wide range of messaging that is necessary and a lack of capacity to

28 IPBES Land degradation assessment collaboration. 2018. The IPBES assessment report on land degradation and restoration. Bonn: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). Available at: <https://www.ipbes.net/assessment-reports/ldr>

29 IPBES (2019): Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (editors). IPBES secretariat, Bonn, Germany.

undertake the type of tailoring of messages required.

12. *Access to information.* Even if messages are tailored appropriately, it is often difficult for marginalised groups such as girls, women and indigenous peoples to receive the information effectively. Challenges for such groups include a lack of formal schooling (and associated illiteracy) and/or insufficient resources to access information through routes such as newspapers, radio and the internet.

13. *The diverse array of ecosystem restoration benefits.* The public is usually poorly informed on the full range of benefits that arise from investments in large-scale ecosystem restoration partly because the benefits are so diverse, span numerous economic sectors and scientific disciplines, accrue over large areas, generate public as well as private goods, and often only fully materialise many years, even decades, after the intervention. This makes compiling a comprehensive overview of the benefits challenging. Ecosystem restoration of a degraded ecosystem can, for example, generate benefits for sectors such as: crop farming, through increased soil quality and pollination services from insects; livestock farming, through increased availability of fodder; domestic water supply, through increased infiltration of rainwater into aquifers; tourism, through improved landscape aesthetics; small businesses, through increased supply of products harvested sustainably from ecosystems; disaster risk reduction, through improved functioning of ecosystem services such as coastal defences against storm surges; and the health sector, through the reduced prevalence of vector-borne diseases and reduced exposure of the general public to air and water pollutants.

14. *Access to markets for natural resource-based small medium and micro enterprises (SMMEs).* It is frequently difficult for local communities to capitalise fully upon the products generated within restored ecosystems (e.g. fish, non-timber forest products, fodder, and timber) because access to the appropriate markets is constrained. Marginalised groups such as women and indigenous peoples are often particularly constrained in this regard because of *inter alia* an unsupportive policy/legislative environment and lack of financial resources.

15. *Analysis of benefits and trade-offs in isolation.* Given that the long-term benefits of ecosystem restoration accrue to different sectors of society, if they are analysed, the analyses are usually done in silos in different government departments, university departments, think tanks, business groups, farmer groups, international conventions and NGOs. Furthermore there is seldom the diverse array of experts (from numerous disciplines) available for undertaking the highly specialised work needed to give a full picture of the likely benefits and trade-offs of large-scale ecosystem restoration for society as a whole. Such work includes for example quantifying: the increased supply of public and private goods; the economic multiplier effects from the use of these goods; and the increases in tax revenues for governments through time.

16. *Negotiations on trade-offs.* For most ecosystems, there is usually a relative scarcity of information on the full suite of benefits and trade-offs from large-scale ecosystem restoration. As a result, the trade-offs are seldom presented for discussion and negotiation across different sectors at local, national or international fora. This problem is compounded by: information on the benefits and trade-offs not being available in a format that can be easily digested by stakeholders spanning numerous sectors; a shortage of platforms for in-depth cross-sectoral discussion on public and private investment decisions on ecosystem restoration; and a limited number of facilitators with the appropriate skillsets for managing negotiations on trade-offs across sectors.

17. *Insufficient recognition of ecosystem restoration champions.* The general lack of awareness of the importance of ecosystem restoration for the well-being of current and future societies means that people who are making major contributions to ecosystem restoration initiatives are seldom given local, national or global recognition. There is consequently a general scarcity globally of ecosystem restoration champions – people who can be role models for those wanting to make a significant contribution to ecosystem restoration and who can raise the profile of ecosystem restoration within society as a whole.

Women and girls, in particular, are often well positioned to be ecosystem champions within local communities in rural areas because of the role they play in managing natural resources whilst producing food and managing fuelwood supplies. Laws and customs in many ecosystems, however, prevent women from owning or inheriting land and taking decisions on land use. As a result, their role as ecosystem champions is often greatly constrained.

18. *Absence of ecosystem restoration in education curricula.* Ecosystem restoration is not commonly taught in formal education systems across the world, and consequently most people do not have the nuanced understanding of the underlying principles to form an educated view on its global importance. Additionally, groups who are heavily engaged with and reliant on ecosystem resources – including women, girls and indigenous peoples – often do not have access to knowledge on ecosystem restoration. This is primarily because of unequal education opportunities and such groups not having access to conventional sources of information (e.g. newspapers, internet). Dissemination of knowledge that depends on writing and reading, for example, does not engage illiterate groups – of which women and girls and indigenous groups make up a large proportion.

19. *Complex narrative for investors.* The complexity of the full suite of benefits from large-scale ecosystem restoration, including their long-term nature and the inherent uncertainties associated with them, usually prevents a simple narrative being given to investors. This is despite the business case often being compelling, once the full suite of long-term benefits of ecosystem restoration are fully analysed.

20. *Public Private Partnerships models needed for ecological infrastructure.* In some ecosystems, the business case for ecosystem restoration is compelling for private sector investors, whilst in other ecosystems, the benefits include a mix of public and private goods, which are more suited to a public private partnership or an intervention funded solely with public funds. Structures for managing combined public and private sector investments into ecosystem restoration are, however, usually either not available at the national level or require a lot of time and investment to establish. Such structures have historically been tailored for investments in grey infrastructure such as roads, buildings and dams, as opposed to ecological and other green infrastructure generated by investments in ecosystem restoration.

21. *Scarcity of global or local funds focussed on ecosystem restoration.* There are only a few funds globally – either in the process of being established, or operational and disbursing funds – that focus on assisting ecosystem restoration practitioners to develop bankable business plans for ecosystem restoration, to implement ecosystem restoration and/or to source additional appropriate investors. As a result, most ecosystem restoration practitioners globally do not currently have easy access to funders that are prepared to work with them to quantify and package the benefits of large-scale ecosystem restoration in a format that is appropriate for investor scrutiny.

22. *Access to commercial finance.* Even where business cases for restoration, based on private sector income streams, are compelling, it is usually difficult to raise finance from commercial banks or finance institutions. This is because of *inter alia* the length of time required to repay the loan, the uncertainty inherent in the trajectory of ecosystem recovery and the scarcity of ecological knowledge amongst staff in the institutions involved.

Political will

23. Numerous factors conspire to prevent sufficient political will developing at local, national and international scales to catalyse investments in large-scale ecosystem restoration. The main factors are described in brief below.

24. *Public pressure on leaders.* For reasons described above, there is usually minimal public pressure on leaders to comprehensively analyse numerous ways of using a particular ecosystem (including large-scale ecosystem restoration) and to view large-scale ecosystem restoration as a long-term investment into the future well-being of their society. Leaders are in particular not being pressurised to quantify the long-term benefits and cross-sectoral trade-offs of different ways of using ecosystems prior to their decision-making.

25. *Short-term benefits of degradation.* Activities which yield short-term benefits but degrade ecosystems are often perceived in a positive light by the general public, partly because the long-term or spatially disconnected costs of degradation and the full suite of benefits of large-scale ecosystem restoration are poorly understood. In some countries the system of Natural Capital Accounting has been introduced to rectify this information gap by mainstreaming ecosystem services valuation into decision-making processes. Implementation of this system has been constrained by the complex, interdisciplinary nature of ecosystem services valuation as well as limited political will and capacity. This constraint has been felt most acutely in developing countries where detailed information on the costs and benefits of competing land-use options is urgently needed but is often not available.

26. *The daunting scope of ecosystem restoration.* The scale and wide range of requirements – such as technical skills, funding, land area, governance structures and value chains – for large-scale ecosystem restoration is often perceived to be daunting by the general public and decision-makers.

27. *The perceived risk.* The complexity, and associated uncertainty with large-scale ecosystem restoration in many ecosystems, often results in a general perception by the public and decision-makers that the risks involved with such investments are too great.

28. *Conflicting interests.* In some ecosystems, conflicts may arise between groups wanting to protect ecosystems, extract natural resources or sustainably harvest ecosystems. These conflicts can involve stakeholders such as government institutions, civil society, rights-holders and indigenous peoples with historical claims to natural resources. Mediation of such conflicts requires specialised skills and an in-depth understanding of the political environment, with its associated power dynamics. Marginalised groups with minimal political power are often critical partners in restoration initiatives. Elevating their status in the mediation process is consequently an important part of effective conflict resolution for implementation of long-term, large-scale and sustainable ecosystem restoration.

29. *Short-term political cycles.* There is a major disconnect between the long-term benefits of ecosystem restoration that accrue over decades and the short-term political cycles in many countries, where power may shift from one political party to another in the space of four to five years. The use of direct democracies and citizen assemblies could help overcome this barrier, but these mechanisms do not exist in most countries.

30. *An environmental as opposed to developmental agenda.* Some decision-makers in governments and corporates perceive large-scale ecosystem restoration to be an environmental agenda to conserve biodiversity rather than an investment that will yield numerous social, economic and environmental returns for society. Such decision-makers tend to see the evidence that large-scale ecosystem restoration can yield considerable returns across sectors such as agriculture, water supply and health as being too weak and uncertain for serious consideration. The absence of cost-benefit analyses as part of decision-making processes in many countries places a further constraint on including these broader considerations into policy decisions.

31. *Linking local interventions to global initiatives.* Local ecosystem restoration initiatives that are given prominence on the global stage because of the contribution they are making to international causes tend to garner more political support locally than initiatives that do not get global recognition. It is, however, currently difficult for local initiatives to be recognised internationally because of a relative scarcity of platforms for sharing ecosystem restoration experiences with the global public.

32. *Insufficient investment into infrastructure required for ecosystem protection and restoration.* Large-scale restoration in terrestrial as well as marine environments often requires significant investment in infrastructure and running costs for operating seed banks, nurseries, herbaria and laboratories.

33. *Limited coordination among authorities.* Large-scale restoration requires considerable cross-sectoral coordination within a country and often also between countries. Such coordination is frequently missing and constrained by a lack of trans-boundary goals and agreed upon standards for ecosystem restoration.

Technical Capacity

34. *Diversity of expertise.* Large-scale ecosystem restoration within any ecosystem invariably requires close collaboration amongst a wide range of individuals and organisations equipped with a diverse array of skills as well as technical knowledge specific to that ecosystem. In many ecosystems there is an insufficient number of individuals and organisations with the necessary skills and knowledge, as well as inadequate access to technology and data. The types of capacity that are often missing in large-scale ecosystem restoration initiatives can be divided into three categories, namely the enabling environment, organisational capacity and individual capacity, as outlined below.

35. *Enabling environment.* The enabling environment category includes capacity for society to develop appropriate: political commitment and visions; policy, legal and economic frameworks; national public-sector budget allocations and processes; governance structures; incentives; and social norms. The organisational category includes the capacity of a wide range of public as well as private organisations pertaining to management (functions, structures and relationships), operations (processes, systems, procedures, incentives and values), human and financial resources (policies, deployment and performance), knowledge and infrastructure. Lastly, individual capacity refers to people with the necessary knowledge, mindsets, technical skills and managerial skills. Marginalised groups such as women, youth and indigenous peoples are often lacking this capacity because of unequal opportunities in terms of access to education and information.

36. *Cross-cutting capacities.* Technical capacity (relating to the social, economic and environmental factors to be considered during the design, implementation and maintenance of restored areas) is a cross-cutting need that spans the enabling environment, organisations and individuals. Functional capacity is also cross-cutting. This type of capacity enables local, subnational and national institutions to plan, lead, manage and sustain ecosystem restoration initiatives effectively and to ensure that technical knowledge is embedded in the initiatives. It also equips the institutions to undertake long-term research on the ecosystem restoration and to use the results of the research to adjust protocols being used by the ecosystem restoration practitioners. Examples include capacities to: formulate and implement policies; access, generate, manage and exchange information; engage in networks, alliances and partnerships; and implement programmes through effective cross-sectoral planning, budgeting, monitoring and evaluating.

37. *Capacity for initiating ecosystem restoration.* The capacities of the enabling environment, organisations and individuals are strongly dependent on the availability of knowledge with regards to designing, implementing and sustaining large-scale ecosystem restoration initiatives. Capacity constraints related to this availability of knowledge and frequently encountered in upscaling ecosystem restoration initiatives are outlined in the table below.

Technical capacity which is often unavailable and consequently constrains ecosystem restoration initiatives

Policy-makers who have the capacity to:

Identify how current government policies (national, local and sectoral) are affecting processes of degradation as well as ecosystem restoration, both nationally and globally.

Reform and harmonise government policies and legislation to catalyse ecosystem restoration (including empowering and incentivising landowners, de facto land users, land managers, land custodians and/or local communities to embark on large-scale ecosystem restoration), to integrate ecosystem restoration targets into national climate and biodiversity goals, and to promote cross-sectoral management of ecosystems (including the integration of the science of ecological restoration into policy).

Reform tenure systems for land, freshwater and marine environments to be inclusive for marginalised groups (e.g. under-represented racial and ethnic identities, indigenous peoples, women and girls) and to incentivise local communities to invest in ecosystem restoration activities that will yield short- as well as long-term benefits.

Support the development of legal and policy frameworks to guarantee the human right to a safe, clean, healthy and sustainable environment (including ensuring the full, meaningful, informed and effective participation of rights-holders such as indigenous peoples and local communities) in decision-making related to the protection, sustainable use and equitable distribution of the benefits of healthy ecosystems.

Develop policies that protect and respect the cultural, religious, spiritual, aesthetic and recreational values associated with ecosystems (including the human rights to culture and freedom of religion, and the right of the child to play) and the rights of indigenous peoples and local communities to their traditional knowledge, lands, resources and territories.

Governance and planning experts who have the capacity to:

Develop appropriate, inclusive and gender-responsive governance structures to devolve sufficient power and resources to the local communities undertaking ecosystem restoration.

Undertake community-based landscape/resource use planning and decision-making that is gender responsive and inclusive of marginalised groups.

Facilitate commitments from stakeholders to fund ecosystem restoration and develop mechanisms for the stakeholders to hold one another accountable to the commitments.

Develop equitable cost and benefit sharing models for stakeholders.

Strengthen and/or establish extension support services and local producer organisations on ecosystem restoration.

Develop local institutional frameworks that are suitable for implementing long-term research and undertaking frequent adaptive management based on the data collected.

Develop appropriate governance mechanisms to manage the restored ecosystems for decades ahead.

Facilitate collaboration between institutions involved in specific ecosystem restoration initiatives to build synergies and avoid duplication.

Establish supply chains that enable local communities to implement ecosystem restoration initiatives in a cost-effective and commercially viable manner.

Experts in facilitating dialogues, communication and partnerships who have the capacity to:

Develop mechanisms for cross-sectoral cooperation and coordination on ecosystem restoration initiatives among government agencies at local, subnational and national levels in an inclusive and gender-responsive manner.

Communicate the costs, benefits and trade-offs of ecosystem restoration to decision-makers and the general public.

Develop platforms for cross-sectoral negotiations on the trade-offs involved with large-scale ecosystem restoration in an equitable and participatory manner (with the end goal being consensus among local stakeholders on the mosaic of habitat types and land/ocean uses that are appropriate given the local socio-economic and environmental conditions).

Develop and implement gender-responsive methods for empowering women and girls in dialogue, planning, decision-making and implementation of ecosystem restoration. This includes taking gender-differentiated access to physical spaces (e.g. for workshops and meetings) and information into account, and ensuring appropriate representation of women's and girls' voices in discussions on ecosystem restoration.

Facilitate fine-scale participatory planning (after consensus has been reached on the appropriate mosaics of habitat types and land/ocean use) through a process of equitable, inclusive and gender-responsive dialogue on where ecosystem restoration will be undertaken.
Forge and maintain partnerships and networks amongst the wide range of organisations required in a large-scale ecosystem restoration in an inclusive and gender-responsive manner.
Mediate conflicts between stakeholder groups with differing goals and objectives relating to land, freshwater and marine resource use.
Apply the principles of free, prior and informed consent in dialogues with stakeholder groups with conflicting interests.
Package and disseminate technical information on ecosystem restoration for diverse audiences including <i>inter alia</i> natural-resource policymakers, managers of ecosystem restoration initiatives, marginalised groups (e.g. women, girls and indigenous peoples) and technicians in technical departments across governments, international and regional organisations, bilateral and multilateral development cooperation agencies and NGOs.
Economists, entrepreneurs and finance experts who have the capacity to:
Quantify the economic incentives that influence how society uses ecosystems.
Quantify the full suite of costs, benefits and trade-offs of large-scale ecosystem restoration.
Manage commonly encountered cross-sectoral trade-offs (relating to <i>inter alia</i> job creation, income generation, quantity and quality of water generated in catchments, carbon sequestration, agricultural productivity, human health and biodiversity) of restoring ecosystems versus other methods of using ecosystems.
Develop bankable business plans for gender-responsive enterprises that use natural resources sustainably harvested from restored ecosystems and provide meaningful benefits to marginalised groups living in the ecosystems (e.g. indigenous peoples and local communities).
Strengthen community-based organisations, local producer organisations, local administrations and small- and medium-sized enterprises to engage in large-scale ecosystem restoration initiatives, including managing conflicts over the use of ecosystems and land tenure.
Strengthen and/or establish value chains (e.g. high-quality seeds of native flora, timber and non-timber forest products) to sustain ecosystem restoration initiatives and to ensure equitable access to markets for local communities engaged in ecosystem restoration.
Structure funding mechanisms, ranging from seed capital funds to micro-credit, to catalyse ecosystem restoration.
Enhance access to finance for marginalised groups such as women, girls, indigenous peoples and local communities that often do not have the credit history or collateral required by commercial banks or microfinance institutions.
Scientists and technology experts who have the capacity to:
Quantify the socio-economic and biophysical impacts of degradation. This includes developing an understanding of: the links between the health of ecosystems and the supply of goods/services to communities in rural as well as urban environments; how social behaviours affect ecosystem use; how marginalised groups such as women, girls and indigenous peoples are affected by degradation and how their limited access to education affects their natural resource use; and how tenure systems affect natural resource use.
Identify and address the cross-sectoral factors that caused or are still causing degradation of the ecosystem being restored.
Fully consider and incorporate the voices and aspirations of marginalised groups such as women, youth, the elderly and indigenous Peoples in the design of ecosystem restoration initiatives.
Develop ecosystem-specific protocols of ecosystem restoration that detail how local fauna and flora will play a role in the ecosystem restoration process. This includes: analysing successes and failures of past restoration efforts; using the appropriate genetic diversity of fauna and flora; setting appropriate goals for restoration; monitoring and evaluation restoration initiatives; conducting long-term research to hone restoration protocols; and managing future climate change impacts.
Develop monitoring and evaluation systems (including goals) that are affordable for local stakeholders and are able to quantify granular changes in ecosystem structure and function through time as the ecosystem is restored.
Integrate science, indigenous knowledge and traditional practices within restoration initiatives effectively.
Engage with technology companies to develop platforms and applications that will catalyse large-scale ecosystem restoration.
Integrate consistent standards of ecosystem restoration across existing ecosystem restoration initiatives.

38. *Unequal access to capital and finance.* A wide range of inequalities relating to wealth and land ownership constrain large-scale restoration globally. Insufficient capacities in the enabling environment, organisations and individuals make this particular barrier a considerable challenge. For example, restoration of degraded ecosystems often requires capital investments, reduced short-term returns from the ecosystem and a period of several years before returns on the restoration investment are realised. Access to finance and secure land tenure are consequently critical for making such commitments to restoration. Such requirements often prevent poor communities and marginalised groups (e.g. women, youth, local communities and indigenous peoples) from making the long-term decisions and investments associated with restoration. The COVID-19 pandemic and climate change are intensifying inequalities in wealth and land ownership, exacerbating this major barrier to restoration.

39. *Burden of poverty.* There are many other ways in which the burden of poverty, particularly for women and girls, greatly constrains restoration. Restricted access to education, economic opportunities and resources (e.g. land, inheritance, credit and agricultural support services) prevents poor communities from developing the skillsets, having sufficient time available, and accumulating the necessary financial resources to implement restoration. For many such communities reducing the use of natural resources to a sustainable level is not feasible because their food security and/or livelihoods would be threatened.

40. *Rights of indigenous peoples.* Inequalities faced by indigenous peoples are another major challenge for upscaling of restoration globally. Decisions on land use have in many landscapes marginalised indigenous peoples and local communities, without recognising their: i) collective rights to land and resources customarily owned or used; ii) their systems for robust, inclusive discussion and decision-makings; and iii) their considerable capability and knowledge with regards to sustainable natural resource use and ecosystem restoration.

41. *The scientific platform.* The applied science of restoration ecology is a relatively new academic discipline that advances by analysing datasets collected over decades from plot-scale ecosystem restoration experiments. The long-term nature of the research, the paucity of large-scale ecosystem restoration experiments, and the inherent complexity of ecosystems means that knowledge on how to undertake large-scale ecosystem restoration is generated slowly. The science is further disadvantaged by being relatively poorly funded, with minimal investment into research and development taking place to hone methods of large-scale ecosystem restoration and to maximise the benefits for society in the long-term. As a result of the above factors there are often gaps in technical knowledge that constrain the upscaling of ecosystem restoration globally.

42. *The context-specific nature of ecosystem restoration.* Knowledge gaps are particularly apparent at a local level with regards to how to design, implement and sustain large-scale ecosystem restoration over time. This is because the approach to ecosystem restoration needs to be tailor-made to fit the unique socio-economic and biophysical conditions of any particular ecosystem. Generic protocols and approaches provide useful templates for ecosystem restoration practitioners, but experts from across numerous disciplines are invariably required to provide highly specific technical knowledge for the local context.

43. *Countering extreme degradation.* In certain environments, the state of degradation is so extreme that restoration options are greatly constrained. Examples of such environments include highly polluted sites, mine sites where topsoil has been lost, and landscapes where extinctions of flora and/or fauna occurred.

44. *Setting goals and mitigating unintended negative consequences.* It is difficult to model what the impacts of a wide array of interventions – such as policy reform, tax incentives, changes in zoning laws, shifts in subsidies, increased availability of funding for large-scale ecosystem restoration, calls for changes in consumption patterns, cross-cutting capacity development, and increased availability of tools for ecosystem restoration – will be at local, national and global scales. As a result, it is challenging to set realistic goals for all these scales and to mitigate unintended negative impacts. An example of the complexity involved is the need to model how changes in diets from animal-based to plant-based globally may improve the state of ecosystems, alter income streams for rural livestock farmers, affect national economies and affect the health of local communities unable to obtain sufficient nutrition through plant-based diets.

45. *An understanding of what past ecosystems yielded for society.* The manner in which degradation over decades or even centuries reduced the carrying capacity of a particular ecosystem, in terms of natural resources such as fruits, fodder, fish, timber, medicines, honey and fibre, is often not recorded. Other services provided by the ecosystem such as provision of high-quality water in aquifers and streams or pollination of crops are also often not documented. Societies living within that ecosystem, whether it be in an urban or rural setting, have long since adjusted to a new normal of the ecosystem not only producing a fraction of what it used to yield per hectare for earlier generations, but also now possibly exposing people to pollution and in many cases a greater density of disease vectors. It is consequently often difficult for people to envisage what healthy ecosystem can provide in terms of sustainable yields of natural resources and reduced environment-related health problems. Such benefits have usually not been

quantified or deliberated on by decision-makers because it requires extensive work and collaboration from a highly skilled multi-disciplinary team of experts to model the effects of large-scale ecosystem restoration in any particular degraded ecosystem.

46. *Uncertainties in both costs and benefits.* The short-term benefits of degradation are often given greater prominence in decision-making processes than the likely long-term benefits of ecosystem restoration. This tends to be because the short-term benefits and capital costs of activities that ultimately degrade an ecosystem are easier to quantify than both the long-term benefits and the short-term capital costs of ecosystem restoration activities. The long-term negative effects of the degradation are also often difficult to quantify and therefore tend to be heavily discounted in the decision-making processes of how to use ecosystems.

Annex 2. Indicative activities and sub-activities

The activities and sub-activities presented in the table below are indicative because it is not known which partners will contribute to their implementation. Commitments to undertake specific activities will take place during the course of the Decade as partnerships are developed and funds are raised. A wide range of potential activities are presented, including suggestions from stakeholders who commented on the online draft strategy. Roles and responsibilities will be collaboratively developed with core partners at the outset of the Decade and will be presented in an Implementation Plan (which will be made available online on the Decade's website).

UN Decade on Ecosystem Restoration: Indicative activities and sub-activities
Pathway 1. Global Movement
Increased knowledge and awareness globally on ecosystem restoration opportunities
<p>Establish a digital hub to facilitate a global movement on ecosystem restoration.</p> <ul style="list-style-type: none"> • Design and operationalise a digital hub to promote interaction, dialogues and exchange of data with the global movement. Indicative sub-activities are listed below. <ul style="list-style-type: none"> ○ Connect existing relevant platforms that have a strong track record of engagement with users of the hub. ○ Identify appropriate methods of information dissemination for different groups and scales, including marginalised groups such as women, girls and indigenous peoples. ○ Develop and publish 'calls to action' on the hub for individuals, governments, corporates and NGOs to contribute to the Decade. ○ Create a platform on the hub for individuals and organisations to establish virtual communities that can develop their own calls to action, implementation plans and deliverables. ○ Make materials available to the global movement through the hub on <i>inter alia</i>: root causes of degradation; the threats that degradation and climate change pose to society; definitions of ecosystem restoration; the costs/benefits of ecosystem restoration; the design, implementation and sustainability of ecosystem restoration initiatives; and how ecosystem restoration can support the achievement of all the SDGs. Materials will include those that already exist, as well as those produced under the Decade. ○ Track the progress/impact of the global movement's efforts using the hub. ○ Promote coordination between existing restoration initiatives at local, national, regional and global levels. ○ Provide a database/inventory of past and current restoration projects, conventions, organisations and other groups or initiatives relevant to restoration (using the Society for Ecosystem Restoration database as a platform). ○ Link to Mentor-Protégé initiatives that couple small local firms with international corporates involved in ecosystem restoration. ○ Use an adaptive management approach to adjust and hone the design and functionality of the hub as needed. This includes ensuring that the hub is functional on mobile phones and that the design of the hub changes through the course of the Decade as hardware and software evolves.
<p>Disseminate information on the digital hub on a wide range of topics relevant to ecosystem restoration. This will include materials that already exist, as well as new materials produced under the Decade.</p>
<p>Promote the Decade through a wide range of channels.</p> <ul style="list-style-type: none"> • Develop and circulate TV shows, radio shows, newspaper articles, magazine articles, films, webinars, video games and videos on ecosystem restoration benefits. • Publicise the Decade using social media channels, including Instagram, Twitter and popular YouTubers. • Host dialogues on a wide range of topics related to ecosystem restoration (see examples at the bottom of this table) using online platforms, webinars, communities of practice, TV and local radio stations. Communication should be in as many languages as possible. • Propose activities focussing on two to three SDG themes per year, based on the themes set for review by the High Level Political Forum in New York in June/July each year. • Hold competitions, through for example the X Prize Foundation, to catalyse advances in monitoring ecosystem restoration success. This could include: measuring soil organic carbon remotely; using remote sensing and unmanned aerial vehicles for monitoring environments that are currently difficult to assess remotely; and developing smartphone applications that provide information on ecosystem restoration success and can channel funds/payments to ecosystem restoration practitioners on the ground. • Partner with media organisation and social media actors. This would be undertaken in an organic, iterative manner to ensure alignment with what audiences expect from social media personalities. • Partner with artists who can promote the Decade through <i>inter alia</i> sculptures, paintings, drawings and films. • Partner with advertising and marketing agencies, as well as global news outlets. • Align the Decade with existing global awareness-raising events such as Earth Day.
Societal behaviours and perceptions shifted with regards to best practices for restoring ecosystems globally

UN Decade on Ecosystem Restoration: Indicative activities and sub-activities

Establish a task force to develop a standards-based approach to ecosystem restoration, capitalising on existing materials wherever feasible.

The task force will comprise representatives of *inter alia* Decade core partners and experts within the global movement to integrate standards of ecosystem restoration across existing initiatives for use in the development of a range of guidelines. These representatives will include women, youth, indigenous peoples and other marginalised groups. Activities to be facilitated or undertaken by the task force will be developed by the task force's constituents. Proposed activities are listed below.

- Develop guidelines on how to communicate and implement a standards-based approach across current and future ecosystem restoration initiatives.
- Develop sector-specific ecosystem restoration standards consistent with international standards.
- Develop guidelines on which social, economic and environmental criteria to use for assessing how activities are contributing to an ecosystem restoration goal (e.g. criteria relating to FPIC and VGGT).
- Develop guidelines on appropriate global goals for ecosystem restoration and local- or national-level targets, including those within global conventions, such as the SDGs.
- Develop a global scorecard to measure outcomes and effectiveness of initiatives aligned with the Decade and to assess whether a net gain in extent of healthy ecosystems has been achieved.
- Collaborate with the International Standards Organization (ISO) to include ecological ecosystem restoration in existing and new standardization processes.
- Collaborate with and/or manage the IUCN-convened Scientific Board (to be initiated in 2020) that will focus on the theme 'Restoration with Care'.

Establish a task force to develop global calls to action for global leaders to prioritise ecosystem restoration, capitalising on existing initiatives and materials wherever feasible.

The task force will comprise representatives of *inter alia* Decade core partners and experts within the global movement to assist global leaders (in the public and private sector) to prioritise ecosystem restoration and communicate how it cuts across numerous global challenges. These representatives will include women, youth, indigenous peoples and other marginalised groups. Activities to be facilitated or undertaken by the task force will be developed by the task force's constituents. Proposed activities are listed below.

- Develop a conceptual framework for a new values-based imperative on ecosystem restoration for societies globally.
- Develop guidelines on topics, such as: i) root causes of degradation in different ecosystems and practical ways to address them; ii) threats posed to human health and well-being as a result of ecosystem degradation; iii) appropriate changes in consumption patterns and diets to catalyse global ecosystem restoration; and iv) supporting ecosystem restoration value chains to promote ecosystem restoration.
- Develop training courses tailored for heads of state, cabinet ministers, parliamentarians, heads of corporations and heads of NGOs on opportunities for ecosystem restoration.
- Showcase successful ecosystem restoration initiatives (large and small).
- Identify and promote ecosystem restoration champions at local, national and global scales.
- Work with multi-disciplinary teams to prepare investment cases for ecosystem restoration.
- Develop plans for engaging with governments to present investment cases and raise awareness on potential for changes in infrastructural spending, capitalising on existing plans wherever feasible.
- Draft templates of legal documents pertaining to financial and institutional arrangements for catalysing investments in large-scale ecosystem restoration.
- Review global and local funds that focus primarily on ecosystem restoration to identify means for expanding and/or replicating them to catalyse large-scale ecosystem restoration globally.

UN Decade on Ecosystem Restoration: Indicative activities and sub-activities

Establish a task force to develop local calls to action for locally-specific ecosystem restoration opportunities, capitalising on existing initiatives and materials wherever feasible.

The task force will comprise representatives of *inter alia* Decade core partners and experts within the global movement to assist local leaders and communities to prioritise ecosystem restoration. These representatives will include women, youth, indigenous peoples and other marginalised groups. Activities to be facilitated or undertaken by the task force will be developed by the task force's constituents. Proposed activities are listed below.

- Quantify ecosystem restoration opportunities in particular landscapes and seascapes (using, for example, tools such as IUCN's ROAM), including costs and benefits, opportunities for scaling up, types of restoration, and the trade-offs across economic sectors.
- Undertake a stocktake of ecosystem restoration opportunities at a national level, including how to embed ecosystem restoration into policy processes (e.g. NDCs) and investment decisions by ministries of finance.
- Develop guidelines on how to prepare business plans with multi-disciplinary teams with a focus on: i) sophisticated packaging for an investor audience; ii) financial modelling; iii) sensitivity analyses; iv) long-term cash flows; v) internal rates of return; and v) preparations needed for investor road shows.
- Identify bankable ecosystem restoration projects, assist ecosystem restoration practitioners prepare bankable business plans and introduce suitable investors to the projects. Such projects could be led by private sector companies, individuals and/or local communities.

Package technical content developed for a wide range of audiences, capitalising on existing initiatives and materials wherever feasible.

- Identify appropriate mediums of communication for different target audiences, including marginalised groups such as women, youth, indigenous peoples and local communities.
- Prepare a wide range of materials on ecosystem restoration, including results from the Decade's task forces, for dissemination. These materials could include for example YouTube clips, media articles, films, radio shows, books, reports, manuals and peer-reviewed scientific papers. Examples of topics to be covered by these materials are presented at the end of this table.

Ecosystem restoration mainstreamed into education systems globally

Develop content on ecosystem restoration to include in primary, secondary, tertiary and adult education systems, capitalising on existing initiatives and materials wherever feasible.

- Produce detailed evidence-based learning materials on causes of degradation, benefits of restoration, and the methods of restoration, in partnership with local institutions to ensure content is relevant to the local context. These materials will be included in school and university courses on a wide range of subjects, including *inter alia* ecology, economics, engineering, geography, literature, mathematics, statistics, business studies, agronomy, journalism, politics and social science. The subject matter should include information on freshwater and marine systems as well terrestrial systems.
- Promote hands-on ecosystem restoration activities in extra-curricular classes.
- Publish educational material under licensing that allows open distribution and adaptation of its contents, such as the Creative Commons license or the GNU Free Document License.
- Share educational material directly with teachers and lecturers.

Assist schools, colleges and universities in designing, implementing and sustaining ecosystem restoration plots, capitalising on existing initiatives and materials wherever feasible.

- Develop school lessons and college/university lectures to be conducted within the ecosystem restoration plots.
- Tailor lessons and lectures for both in-field (in degraded and intact landscapes) and in-classroom learning.
- Encourage the planting and maintenance of gardens on school and university properties.

Investments into large-scale ecosystem restoration catalysed

Undertake national scenario analyses showing the range of development pathways with and without ecosystem restoration (with associated costs and benefits), capitalising on existing initiatives and materials wherever feasible.

- Assist governments and the private sector to model the full suite of socio-economic and environmental benefits associated with large-scale ecosystem restoration in sub-national and site-level contexts (using tools such as IUCN's ROAM).

Develop a range of options for structures of global funds, local funds and public-private partnerships (PPPs), capitalising on existing initiatives and materials wherever feasible.

- Engage with governments to invest in research and development that generates innovative approaches for upscaling ecosystem restoration through different funds and through PPPs.
- Engage with international and local finance institutions to unlock funding for large projects aimed at achieving structural transformation at the national and international scale, as well as smaller projects focussed on restoration at the community level.
- Raise awareness and promote innovative financing instruments for ecosystem restoration, including ecosystem services bundling, payments for ecosystem services and green bonds

UN Decade on Ecosystem Restoration: Indicative activities and sub-activities
<p>Facilitate government and private sector investment in PPPs, value chain development and the implementation of business plans, capitalising on existing initiatives and materials wherever feasible.</p> <ul style="list-style-type: none"> Undertake market studies and gap analyses of value chains that can potentially facilitate ecosystem restoration (e.g. timber and NTFPs). Provide materials and tools to governments and the private sector for facilitating the production of appropriately packaged, bankable business plans. Support governments and other stakeholders in establishing frameworks for implementing payment for ecosystem services and green bonds
Pathway 2. Political will
Policy reforms that promote large-scale ecosystem restoration developed and implemented
<p>Develop a range of options (which can be tailored for use in different local contexts) for structures rights-based tenure arrangements, subsidies and tax incentives to promote ecosystem restoration, capitalising on existing initiatives and materials wherever feasible.</p> <ul style="list-style-type: none"> Undertake technical studies to assess the social, economic and environmental effects of shifting fossil fuel, fisheries, forestry and agricultural subsidies to investments in ecosystem restoration at local, national and global levels. Develop guidelines for adjusting fossil fuel, fisheries, forestry and agricultural subsidies to catalyse large-scale ecosystem restoration. Develop guidelines on how to apply the UN Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in restoration initiatives. Establish platforms for cross-governmental and cross-sectoral dialogues on the effects of subsidies on ecosystems and the potential for adjusting subsidies to promote ecosystem restoration (e.g. through the World Trade Organisation for cross-governmental dialogue and through the Decade’s digital hub for cross-sectoral dialogue). Hold dialogues focussed on specific subsidy types and topics. For example, some dialogues could focus on the point that the UN Secretary General has repeatedly stated in 2019 and 2020 that all fossil fuel subsidies should be stopped. Methods for diverting current fossil fuel subsidies to post-COVID-19 economic recovery, including investments in ecosystem restoration, could be presented in such a dialogue. Disseminate the outcomes of the above-mentioned dialogues on the digital hub.
<p>Develop a range of methods (which can be tailored for use in different local contexts) for enhancing the enabling environment for SMMEs focussing on ecosystem restoration, capitalising on existing initiatives and materials wherever feasible.</p> <ul style="list-style-type: none"> Develop guidelines on how to enhance access to finance for marginalised groups such as women, girls, indigenous peoples and local communities that often don’t have the credit history or collateral required by commercial banks or microfinance institutions. Develop guidelines on how to include local entrepreneurs, local producer organisations and smallholder producers in the development of natural resource-based enterprises which use goods and services from restored ecosystems. Develop guidelines on how local restoration practitioners can use the UN brand of the Decade to lift their projects beyond the local context and provide international credibility.
Develop monitoring and reporting systems to highlight the effects of fossil fuel, fisheries and agricultural subsidies at a national level versus the benefits of channelling subsidies towards ecosystem restoration.
Cross-governmental and cross-sectoral collaboration on ecosystem restoration increased
<p>Initiate dialogues between governments, non-governmental organisations (NGOs) and across sectors on how to innovate and catalyse large-scale ecosystem restoration, capitalising on existing initiatives and materials wherever feasible.</p> <ul style="list-style-type: none"> Establish appropriate platforms for the dialogues (e.g. through the Decade’s digital hub). Provide technical material for the dialogues. Topics will be determined based on the specific country context and taking the barriers listed in Annex 1 into account. Examples of such topics are presented at the end of this table.
National ecosystem restoration opportunities championed by Heads of State, Ministers of Finance, Ministers of Planning and Development and business leaders
<p>Initiate dialogues for Heads of State, Ministers of Finance, Ministers of Planning and Development (or equivalent officials) and business leaders capitalising on existing initiatives and materials wherever feasible.</p> <ul style="list-style-type: none"> Establish appropriate platforms for the dialogues (e.g. through the Decade’s digital hub). Provide technical material for the dialogues and trainings. Develop guidelines on how to collect the appropriate data for including ecosystem restoration in national accounting systems, avoiding the use of proxy data and associated inaccuracies. Collate and communicate existing best practices and restoration initiatives catalysed by government funding globally.

UN Decade on Ecosystem Restoration: Indicative activities and sub-activities

Pathway 3. Technical capacity and scientific knowledge

Methods for designing, implementing, monitoring and sustaining ecosystem restoration initiatives improved and disseminated to ecosystem restoration practitioners globally

Establish a task force to produce and promote scientific research and technical content on ecosystem restoration, capitalising on existing initiatives and materials wherever feasible.

The task force will comprise representatives of *inter alia* Decade core partners and experts within the global movement to provide standards and guidelines to reduce the uncertainty of ecosystem restoration outcomes. These representatives will include women, youth, indigenous peoples and other marginalised groups. Activities to be facilitated or undertaken by the task force will be developed by the task force's constituents. The findings and outputs of the task force will be shared via the digital hub. Proposed activities are listed below.

- Undertake in-depth analyses of case studies on large-scale ecosystem restoration globally, including successes and failures, to identify critical factors leading to success.
- Develop guidelines on how to assess ecosystem restoration potential (based on existing methods of multi-stakeholder planning and implementation processes) and how to prioritise ecosystem restoration activities within different land and seascapes.
- Facilitate a comprehensive gap analysis process that identifies gaps in resources, training needs and technical knowledge/research needs, prior to developing new resources.
- Develop a framework for measuring socio-economic and biophysical improvements achieved through ecosystem restoration in terrestrial, freshwater and marine ecosystems, including outcome indicators and metrics, using the Society for Ecological Restoration's standards as a starting point. This framework would include the use of baseline/reference ecosystems for quantifying the progression of the restoration.
- Advise on how to monitor outcome indicators and metrics, including using remote sensing technology.
- Facilitate the use of existing sets of protocols, tools and training mechanisms for restoration of specific landscapes and seascapes, and where necessary develop additional sets. These sets will include methods for the design, implementation and maintenance of the interventions, and will focus on achievement of ecosystem restoration standards and targets. They will also include standards for ensuring sufficient scientific evidence is collected at a site level to minimise the risk of unintended negative consequences from interventions (e.g. inappropriate tree species being used in the restoration). An example of such a standard is the European Committee for Standardization (CEN) standard being developed for river restoration in Europe.
- Develop a set of guidelines for assessing and taking into account the prevailing socio-economic and biophysical conditions at individual ecosystem restoration sites to ensure *inter alia*: i) appropriate incentives are in place for communities to support the long-term maintenance of the restored environment; ii) environmental, social and human rights standards are incorporated; iii) gender considerations are appropriately incorporated.; iv) free, prior and informed consent is obtained; and v) necessary social safeguards are in place.

Facilitate the development of guidelines and/or training courses on specialised topics relating to ecosystem restoration. Examples of such topics, provided by stakeholders commenting on the online draft strategy, are presented at the end of this table.

Facilitate the development of technology (and/or improve existing systems) for designing, implementing, monitoring and evaluating large-scale ecosystem restoration, capitalising on existing initiatives and materials wherever feasible.

- Facilitate citizen science programmes to monitor and evaluate large-scale ecosystem restoration initiatives.
- Establish long-term research programmes within university and state organisations to monitor and evaluate large-scale ecosystem restoration initiatives over decades.
- Use the Decade's digital hub to disseminate tools and protocols on ecosystem restoration.

Develop an Ecosystem Restoration Starter Kit for organizations and individuals who want to be involved in ecosystem restoration activities.

- Develop, publish and disseminate an Ecosystem Restoration Starter Kit, comprising a Basic Starter Kit and a more detailed Ecosystem Restoration Handbook. The basic kit will act as both introductory material and as a framework for developing the more detailed handbook. It will be designed using a similar structure to that of the ESRAG and World Environment Day Handbook, and will include explanations of what ecosystem restoration is and why it is important. Examples of how to become involved in ecosystem restoration – locally, regionally and globally – either by initiating a new, or a joining an existing initiative will be provided. In addition, the starter kit will describe the Decade's three pathways to ecosystem restoration, and the barriers inhibiting them. The handbook will build on the framework established in the basic kit, expanding on the themes and plans therein whilst also providing examples for engagement and pathways forward. It will focus predominantly on assisting organisations to capitalise on ecosystem restoration opportunities.

Topics for dialogue, analysis, presentation and dissemination within Pathways I, II and III, with a focus on the ultimate goal of catalysing ecosystem restoration.

UN Decade on Ecosystem Restoration: Indicative activities and sub-activities

The topics presented below were raised by stakeholders during the development of the draft strategy and in feedback received on the online draft strategy. Each topic could, as a first step, be used as a theme for a webinar or a workshop in a conference setting. The outcomes of such webinars or workshops should be further agreed steps towards actions that directly catalyse or contribute to catalysing large-scale ecosystem restoration.

Topics relating to social factors, institutions, governance

- The value of indigenous and traditional knowledge for restoration initiatives.
- Showcasing restoration initiatives led by marginalised groups such as women, youth, indigenous peoples and local communities.
- How to incentivise individuals and local communities to make long-term investments in ecosystem protection and restoration, including the sustainable use of resources from rangelands, forests, wetlands, fisheries and agro-ecological food systems.
- Tools and methods for mediating conflicts between different stakeholder groups.
- The use of cities as hubs of innovation for ecosystem restoration by connecting existing urban networks and platforms that focus on green spaces and nature.
- Methods for disseminating materials to communities and individuals without access to the digital hub and social media (e.g. through outreach programmes and awareness-raising campaigns).
- The tailoring of materials (for a wide range of different stakeholders, including for example governments, policymakers and investors) on economic and social impacts of “business as usual” operations (i.e. without large-scale ecosystem protection and restoration interventions).
- Methods for analysing failures in ecosystem restoration initiatives to develop a culture of learning from mistakes.
- Disinformation and misinformation relating to ecosystem restoration, with an analysis of why the information is misleading and, where possible, identifying specific market forces or companies that are contributing to the spread of such information.
- Methods for collaborating with disaster reduction agencies, networks and researchers to minimise disaster risks through large-scale ecosystem restoration.
- Developing a common understanding and language of ecosystem restoration to facilitate cross-sectoral dialogues and to cater for the wide diversity of perceptions, expectations and barriers related to restoration.
- The role of regulators (e.g. environmental protection agencies) in compliance and enforcement of ecosystem protection and restoration.
- Applying the principle of free, prior and informed consent in ecosystem restoration initiatives.
- How to apply the UN Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (VGGT), in the context of ecosystem restoration, within ministries, between governments and people, and within civil society.
- Links between ecosystem restoration and achieving SDGs at a national level (tailored for a diversity of audiences, including government, NGOs and the general public).
- Leveraging existing societal support for clean-up operations of polluted sites (e.g. heavy metals, organics) to upscale restoration.
- Opportunities for the tourism industry to engage in ecosystem restoration.
- Methods for conducting, in addition to environmental and social impact assessments, Human Rights Impact Assessments, that explicitly include cultural rights.
- Exploring the concept of ‘humans in nature’ and a values-based imperative for ecosystem restoration.
- Defining the roles of different stakeholders. For example, the multi-faceted roles of NGOs in catalysing restoration is important to document and explain to stakeholders. One such role is the provision of platforms for effective communication amongst the general public, scientists, governments, UN agencies, policymakers and the private sector.
- Guidance for practitioners and stakeholders in rights recognition, community-based monitoring, and establishing forums for autonomous transfer of inter-generational knowledge, in local languages, with the inclusive participation of women and youth.
- Identifying international organisations which have experience in developing and implementing methodologies to assess ecosystem services and supporting the development of policy measures, programmes and projects aimed at ecosystem services restoration. Such organisations can play an important role in promoting political dialogue and providing support to local and national governments.
- Supporting indigenous peoples to plan, finance and implement large-scale ecosystem restoration. Establish a forum for indigenous peoples to exchange experiences on restoration initiatives, many of which are ambitious in scale (see e.g. the Dja Dja Wurrung Country plan¹).
- Supporting civil society organisations and networks in developing tools and testing applications that facilitate grassroots, locally-based ecosystem restoration projects.
- Addressing priority governance gaps relating to large-scale carbon dioxide removal (including around accounting, research investment and implementation and monitoring and reporting) as identified in the IPCC Special Report on 1.5°C Global Warming, 2018².

- Developing and incorporating qualitative measures of restoration success (including the quality of the ecosystem and the livelihoods being supported), alongside quantitative measures (such as area restored and number of trees planted) into monitoring and evaluation activities.
- Methods to work in a fully inclusive manner with marginalised groups (including women, youth, indigenous peoples and local communities) on the design, implementation and long-term maintenance and operations of ecosystem restoration initiatives.
- Methods for expanding a professional workforce in governments, NGOs and private companies to plan, advocate for, fund, and implement ecosystem restoration.
- Applying restorative justice approaches to engage civil society actors, especially youth organisations, women and indigenous peoples, in national policy planning and implementation of ecosystem restoration.
- Enhancing social and environmental justice to ensure good governance over natural resources, including equitable land tenure and resource rights, particularly among indigenous peoples and local communities.
- Introducing legislation, policies and/or regulations that incentivise the private sector to invest in ecosystem restoration in both the short- and long-term.
- Developing mechanisms of enforcement of legislation and regulations related to ecosystem protection and restoration.
- Ensuring that ecosystem restoration is central to all resource use planning processes and is incorporated into national health, infrastructure and security planning;
- Adjusting development policies that inadvertently promote ecosystem degradation.
- Leveraging existing international commitments within MEAs and fostering collaboration among these instruments on ecosystem restoration.
- Training government staff in public policy schools on ecosystem restoration.
- Investing in communication campaigns on ecosystem restoration.
- Developing replicable project units at a local scale and regional epicenters of expertise to coach the units as well as negotiate with central government.

Topics related to finance and economics

- The role of the fossil fuel industry and extractive industries such as mining in ecosystem restoration globally.
- The value of non-economic (e.g. cultural, religious, aesthetic) benefits of ecosystem restoration.
- Strategies to generate the information/data needed for including ecosystem restoration into national accounting systems. This is especially important for developing countries, which often have to resort to using proxy data or inaccurate estimations in their accounting systems.
- Reforming taxation to include green taxes for ecological restoration.
- The role of the finance sector in ecosystem restoration.
- Using divestment strategies to reduce ecosystem degradation.
- Best practices on implementing payment for ecosystem services and green bonds.
- Incorporating data on ecosystem restoration into routine national accounting.

Topics related to science and technology

- The use and value of 'novel ecosystems', comprising indigenous as well as non-indigenous species of fauna and flora. Such ecosystems may be pragmatic restoration outcomes in areas where climate change or extreme pollution limits the potential to restore the ecosystem with indigenous species.
- The role of food production and dietary habits in ecosystem degradation.
- The diversity of new concepts and terminology associated with ecosystem restoration (e.g. rewilding and geotherapy).
- Ecosystem restoration in urban areas, including methods, planning and implementation.
- Integrating indigenous knowledge into evidence-based restoration initiatives.
- The benefits of ecosystem restoration to human health.
- Changes in the rates of degradation in different ecosystems at a global level.
- The contribution that specific systems (e.g. free-flowing rivers, seagrass beds, marine fisheries) can make in adapting to climate change and conserving biodiversity.
- Management of alien invasive species in restored ecosystems.
- The importance of ecological connectivity in restoring ecosystem functioning and how to incorporate this concept into natural resource planning and management.
- The role of soil microbiology in the success of ecosystem restoration initiatives.
- The potential role of forestry in large-scale ecosystem restoration.
- Methods for ensuring sufficient genetic diversity in restored ecosystems to increase resilience to climate change and other environmental changes.
- National and subnational assessments of seed and seedling requirements to meet restoration objectives.
- The concept of resilience in ecosystem restoration, including the principles of managing diversity, redundancy, connectivity, feedback loops and complex systems.

- Building the capacity of subnational and local governments to partake in decision-making processes on natural resource use and to plan, design, implement and sustain large-scale restoration initiatives. National governments are often constrained in their capacity to implement on the ground, and consequently need to rely on subnational and local government entities.
- Methods for facilitating synergies and agreements on appropriate restoration targets at a local, national and global scales.
- Standards for quantifying the health benefits, 'ecological lift' and increased availability of water and quality of water as a result of large-scale ecosystem restoration.
- Methods for identifying areas of highest priority and urgency for protection and restoration of ecosystems.
- Methods for minimising pollution and contamination (e.g. nutrient loads, persistent organic pollutants, metals and plastic debris) in conserved and restored ecosystems (especially freshwater and estuarine ecosystems, which are particularly vulnerable to these disturbances).
- Inventories of existing good practices, methodologies, tools and guidance for: the assessment of ecosystem services; the development of related legal frameworks; and practical measures to catalyse ecosystem restoration across different sectors and ecosystems.
- Incorporating lessons learned in paludiculture (sustainable management of peatlands through wet agriculture) pilot projects into peatland ecosystem restoration worldwide.
- Researching and communicating information on how ecosystem restoration could be beneficial in preventing and addressing future global pandemics.
- Archetype analyses³ to facilitate decision-making for achieving sustainability of restoration initiatives, upscaling of restoration and transfer of knowledge.
- Showcasing and researching restoration in grasslands and savannas. Critical activities would include: determining the rate of loss, level of threat and location of degraded grasslands and savannas globally; building capacity to conduct research on grassland and savanna ecology; and collecting the traditional knowledge on management of these ecosystems.
- Establishing long-term research programmes within university and state organisations to monitor and evaluate large-scale ecosystem restoration initiatives over decades, as exemplified by long-term forest and savanna landscapes monitoring and research plots.
- Identifying and disseminating information on existing restoration reporting systems. For example, with regards to marine restoration, the Regional Sea Conventions and other ocean-related processes have developed the following reporting mechanisms: the Barcelona Convention Reporting System; the MSFD for EU Member States; OSPAR; HELCOM; and the Ocean Conference Voluntary Commitments Registry.
- Conducting strategic foresight exercises with restoration experts and other stakeholders. These are important tools in the design of pathways to more ecosystem-based economic systems, which take into account barriers and trade-offs.
- Developing protocols and practical guidelines for restoring ecosystems with viable, genetically diverse populations to maximise productivity, reproduction, regeneration and adaptive capacity. Several tools are already in development, such as Bioversity International's SeedIt application and Tree Diversity.
- Developing protocols for improving capacity of local nurseries to provide seed and seedling stocks of native plant species used in restoration. Most commercial nurseries are not sufficiently equipped to support large-scale restoration projects. Plant quality is a primary determining factor for the success of most ecological restoration projects in terrestrial systems. Nurseries therefore need to produce high-quality plants with targeted morphological and physiological characteristics to optimise their potential to survive and thrive after outplanting.
- Developing protocols for monitoring and evaluation of seedlings after outplanting, and documenting methods that lead to both success and failure of seedling establishment.
- Making use of the 'opportunity mapping tool' to identify geographic locations where ecosystem restoration is particularly appropriate for reducing the impact of certain hazards⁴.
- Making use of the Mangrove Restoration Potential Map to identify geographic locations where coastal mangroves globally can be restored⁵.
- Investing in research and development to maximise returns from restoration of specific local ecosystems.
- Embedding ecosystem restoration into urban planning and the circular economy approach to development (i.e. minimising resource inputs and waste outputs).
- Analysing the potential relevance to the Decade of new data technologies, such as Big Data, machine learning for data analysis, and advances in remote observation.

Examples of platforms that could potentially host the above dialogues include:

- the Global Partnership on Forest and Landscape Restoration (a global network of governments, NGOs, research institutions, communities and individuals responding to the Bonn Challenge of restoring 350 million hectares of degraded forest by 2030);
- the Restoration Initiative (a collaboration between IUCN, FAO, UNEP and GEF);
- the Collaborative Partnership on Forests (chaired by FAO and supporting the United Nations Forum on Forests);
- the New York Declaration on Forests (a global, multi-stakeholder commitments to halt deforestation and restore degraded forests by 2030);
- the AFR100 African Forest Landscape Restoration Initiative (led by African Member States, with the aim of restoring 100 million hectares by 2030); the Great Green Wall (led by Member States in the Sahel of Africa);

- the Global Landscapes Forum (a knowledge platform on sustainable land use, dedicated to achieving the Sustainable Development Goals and Paris Climate Agreement);
- GLFx (in which communities of practice will be developed within individual towns and cities);
- Initiative 20x20 (which is led by Member States in Latin America and the Caribbean and is restoring 20 million hectares by 2020);
- Ramsar Regional Initiatives (which are supported through the Ramsar Strategic Plan for 2016–2024 that focuses on maintaining and/or restoring 2300 Ramsar Wetlands of International Importance);
- the UN Permanent Forum on Indigenous Issues (an advisory body to the UN Economic and Social Council, with a mandate to discuss issues, such as the state of the environment, relating to indigenous peoples);
- the Local Communities and Indigenous Peoples Platform of the UNFCCC (established to engage local communities and indigenous peoples with *inter alia* nature-based solutions to climate change);
- UNESCO's Man and the Biosphere Programme (with its 701 sites in 124 countries globally);
- The Specialized Technical Committee on Finance, Monetary Affairs, Economic Planning and Integration (hosted by the African Union and attended by ministers of finance, ministers of economic planning and central bank governors);
- the African Ministerial Conference on the Environment (hosted by the African Union, and attended by ministers of environment);
- the Global Mangrove Alliance;
- the Global Peatlands Initiative;
- the Regional Seas Conventions and Action Plans;
- the International Coral Reef Initiative; and
- the Sub-Regional Fisheries Commission.

Annex 3. Initiatives, institutions, education programmes, policies and conventions highlighted by stakeholders in feedback received on the online draft strategy as particularly relevant for the Decade.

The information presented in this annex is not an exhaustive list. It only draws on information provided in the online feedback. Additional information will be added to this 'living document' through the course of the Decade. For further information or to request inclusion in this list, please contact us via email at: restorationdecade@un.org.

Initiatives and institutions

Aduna

Aduna is developing new value chains in West Africa to support ecosystem restoration. This includes a Great Green Wall-linked project, funded by UNCCD. In 2020, Aduna will undertake a pilot project to validate how creating the market for 'transformational ingredients' can directly impact ecosystem restoration in sub-Saharan Africa. Measurable outcomes will be accessible digitally, with a specific focus on enrolling the private sector and addressing knowledge gaps. For more information: <https://aduna.com/>

Aer Aqua Terra

Aer Aqua Terra is dedicated to restoring large scale freshwater ecosystems in Belgium. Their activities focus on clearing waste and pollution, using a citizen-based approach. In 2019, they had over 600 citizens clear pollution from 50 km of streams. For more information: <https://aeraquaterra.wordpress.com/>

AFR100

AFR100 is a country-led effort to bring 100 million hectares of land in Africa into restoration by 2030. The initiative – launched formally at COP 21 in Paris – will support the Bonn Challenge, the New York Declaration on Forests, and the African Resilient Landscapes Initiative. For more information: <https://afr100.org/>

African Conservation Trust

The African Conservation Trust implements conservation and ecosystem restoration projects throughout Africa, with a focus on rural development, endangered species re-introductions, education in schools on environmental matters and raising environmental awareness in society. For more information: <https://projectafrica.com/>

Association of Southeast Asian Nations (ASEAN)

ASEAN has various task forces that are relevant to ecosystem restoration in southeast Asia, for example: the ASEAN Centre of Biodiversity, the ASEAN Working Group on Climate Change, the ASEAN Working Group on Social Forestry Network, and the ASEAN Task Force on Peatlands. The ASEAN Cleaning House Mechanism contains a digital hub that could be a useful guide or interlink for the Decade's hub. It includes information relevant to capacity building in southeast Asia, the progress of conservation projects and areas, and tools for monitoring and evaluation of conservation actions. For more information: <https://asean.org/>.

Australasian Shellfish Reef Restoration Network

The Australasian Shellfish Reef Restoration Network is a Community of Practice that brings together organisations and individuals interested in shellfish reef education, conservation, restoration and management. The network aims to improve awareness of shellfish reef habitat and educate the broader public on the value of shellfish habitat conservation and restoration. It also promotes communication, restoration training, policy and regulation, research and development and implementation amongst network members. For more information: <https://www.shellfishrestoration.org.au/>

Bank on Nature Initiative

The Bank on Nature Initiative is a collaboration between the Rewilding Capital of the Rewilding Europe initiative and the European Investment Bank, under the Natural Capital Financing Facility of the European Commission. It has the objective of catalysing ecosystem restoration in the finance sector. For more information: <https://rewilding-europe.com/news/bank-on-nature-european-investment-bank-boosts-rewilding-europe-capital/>

Better World Cameroon

Better World Cameroon is a grassroots organisation with the objective of building climate resilience of African villages and rural communities. They have a focus on women empowerment, youth and human rights. Flagship projects of the group include the Ndanifor Permaculture Ecovillage and the Bafut Ecovillage. For more information: <http://betterworld-cameroon.com/>

Building New Tools for Data Sharing and Re-use through a Transnational Investigation of the Socioeconomic Impacts of Protected Areas (2020)

This project is taking place in UNESCO designated sites focussing on Africa and South America mining activities and land restoration. For more information: <http://www.unesco.org/new/en/natural-sciences/environment/earth-sciences/international-geoscience-programme/igcp-projects/earth-resources/igcp-project-697/>

Coral Restoration Consortium (CRC)

CRC is a high-level community of practice that comprises scientists, managers, coral restoration practitioners, and educators dedicated to enabling coral reef ecosystems to adapt and survive the 21st century and beyond. The CRC's mission is to foster collaboration and technology transfer among participants, and to facilitate scientific and practical ingenuity to demonstrate that restoration can achieve meaningful results at scales relevant to reefs in their roles of protecting coastlines, supporting fisheries, and serving as economic engines for coastal communities. For more information: <https://reefresilience.org/restoration/restoration-introduction/coral-restoration-consortium/>

ECCA30

ECCA30 seeks to bring 30 million hectares of degraded and deforested land in Europe, the Caucasus and Central Asia into restoration by 2030. It will serve as a regional initiative to secure additional commitments and accelerate the implementation of the Bonn Challenge, the Land Degradation Neutrality and land- and forest-based targets linked to the Paris Agreement. It will facilitate access to technical and financial support, and reinforce regional cooperation and capacity exchange on forest landscape restoration. Further, it will help countries receive international and regional recognition of their restoration ambitions connected to their domestic priorities and projects. For more information: <https://infoflr.org/bonn-challenge/regional-initiatives/ecca30>

Ecosystem Restoration Camps (ERC)

ERC is a global movement of individuals, experts and organisations who are restoring degraded ecosystems around the world. The camps are places where local communities, national and international volunteers, and experts come together to plan ecosystem restoration projects, work together to implement these projects, and provide places of learning and discovery/innovation. For more information: <https://ecosystemrestorationcamps.org/>

EcoShape

EcoShape is a foundation that manages the public-private innovation programme Building with Nature, a new approach in hydraulic engineering that utilises the forces of nature, thereby strengthening nature, the economy and society. Knowledge is developed via pilot projects, in which Building with Nature are realised and monitored. Based on the monitoring results, guidelines for replication and scaling up are developed and disseminated through the EcoShape's website. For more information: <https://www.ecoshape.org/en/>

Environmental Impact Study of Abandoned Artisanal Mining Sites

This UNESCO project identified over 40 sites in Africa which need restoration to improve the health and living conditions and local communities. For more information: <http://abandonedminesafrica.org/>

European Center for River Restoration (ECRR)

ECRR is a network promoting ecological river restoration across Europe, supporting the implementation of the EU Water Framework Directive (WFD), Floods Directive and the UN Sustainable Development Goals, the United Nations Economic Commission for Europe (UNECE) Water Convention, the Convention on Biodiversity, as well as national policies. For more information: <https://www.ecrr.org/>

European Forum for Restorative Justice

The European Forum for Restorative Justice is an international network organisation connecting members active in the field of restorative justice (including practitioners, academics and policy makers) throughout Europe and beyond. For more information: <https://www.euforumrj.org/en/our-mission>

FAO General Fisheries Commission for the Mediterranean

The General Fisheries Commission for the Mediterranean is a regional fisheries management organisation whose main objective is to ensure the conservation and sustainable use of living marine resources as well as the sustainable development of aquaculture in the Mediterranean and Black Seas. For more information: <http://www.fao.org/gfcm/en/>

FAO Globally Important Agricultural Heritage Systems (GIAHS)

GIAHS promotes the safeguarding of the world's agri-cultural heritage systems. Such traditional agricultural systems are often models of sustainable agricultural production. For more information: <http://www.fao.org/climate-change/programmes-and-projects/detail/en/c/878362/#:~:text=In%20order%20to%20safeguard%20and,models%20of%20sustainable%20agricultural%20production>

Forest-Water Champions (FWC)

FWC is a consortium of experts from the forestry and water sectors, advocating for an integrated approach to forest and water management.

Forest Stewardship Council (FSC)

FSC has systems in place, and is currently developing new tools, on forest restoration that could help monitor progress towards restoration targets and commitments. For more information: <https://fsc.org/en>

Global Alliance of Expert Rewilding Practitioners

The Global Alliance of Expert Rewilding Practitioners, unified through the Global Charter for Rewilding the Earth, consists of a network of over 90 organisations with a collective partnership of more than 3,200 different entities. For more information: <https://rewilding.org/tag/global-alliance-of-expert-rewilding-practitioners/>

Global EverGreening Alliance

The Global EverGreening Alliance is an international NGO which coordinates the development and implementation of large-scale environmental restoration and sustainable agricultural intensification projects in developing countries around the world. For more information: <https://afr100.org/content/global-evergreening-alliance>

Global Mangrove Alliance

The Global Mangrove Alliance has produced a digital hub containing easily accessible information related to global mangrove restoration. Their hub has general education content on mangroves as well as the details of mangrove restoration projects making an impact around the world. The alliance also collects and posts the types of resources that help communities, governments, policymakers, the private sector and non-governmental organisations take action and support proven approaches that restore and protect mangroves. The alliance links separate projects into a cohesive initiative that aims to increase global mangrove cover by 20% by 2030. For more information: <http://www.mangrovealliance.org/>

Global Peatlands Initiative

The Global Peatlands Initiative is an effort by leading experts and institutions formed by 13 founding members at the UNFCCC COP in Marrakech, Morocco, in 2016, to conserve peatlands as the world's largest terrestrial organic carbon stock and to prevent this carbon from being emitted into the atmosphere. Partners within the initiative are working together within their respective areas of expertise to improve the conservation, restoration and sustainable management of peatlands. For more information: <https://www.globalpeatlands.org/>

Global Restoration Observatory

The Global Restoration Observatory intends to use pioneering techniques from Sentinel II data that can detect forest restoration in 1–5 years.

GulfCorps

GulfCorps, a project of The Nature Conservancy (TNC) and the National Oceanic and Atmospheric Administration (NOAA), aims to create jobs for hundreds of young adults along the Gulf of Mexico. With the support of the RESTORE Council (Resources and Ecosystems Sustainability, Tourist Opportunities, and Revised Economies of the Gulf Coast States), GulfCorps protects and restores the Gulf's lands and waters while creating jobs through conservation corps in the five Gulf states of the USA (Alabama, Florida, Mississippi, Louisiana and Texas). For more information: <https://www.nature.org/en-us/about-us/where-we-work/priority-landscapes/gulf-of-mexico/stories-in-the-gulf-of-mexico/gulfcorps-launches-in-the-gulf-of-mexico/>

Iberian Centre for River Restoration (CIREF)

CIREF is a group of professionals linked to river restoration in the Iberian Peninsula, coming from universities, authorities, private consultancies and non-governmental organisations, that has the aim of reverting the trend of degradation that these ecosystems undergo at present. For more information: <http://www.cirefluvial.com/en/about-us.php>

ICCA Consortium

ICCA is a consortium of Indigenous and Community Conserved Areas. For more information: <https://www.iccaconsortium.org/>

ICLEI's CitiesWithNature

ICLEI's 'CitiesWithNature' initiative serves as an umbrella platform for urban greening and is endorsed by the Secretariat on Convention on Biological Diversity. It can also provide support in identifying champions for ecosystem restoration in the political landscape. For more information: <https://cwn.iclei.org/>

Indigenous Biocentric Restoration

FAO's Indigenous Peoples Unit and the French National Research Institute for Sustainable Development together with indigenous organizations and support from the FAO Forests and Water Programme are working on implementing the approach of Indigenous Biocentric Restoration. The approach places indigenous peoples at the centre of the decision making for restoration initiatives taking place in their lands, territories and natural resources. New technologies will be blended with ancestral knowledge and with those elaborated territorial management practices that have allowed indigenous peoples to sustainably use and conserve their territories for centuries. Indigenous Biocentric Restoration and Conservation processes will be led by indigenous peoples themselves and therefore rooted in their cosmogony and indigenous food systems and informed by their traditional knowledge.

Indigenous Women's Biodiversity Network (IWBN)

IWBN was formed in 1998 during the 4th Conference of Parties (COP) to the Convention on Biological Diversity (CBD). The objective of the IWBN is to bring the issues of indigenous women to the forefront of international discussions while emphasising the vital role they play in biodiversity conservation. For more information: <https://www.iwbm-rmib.org/>

Intergovernmental Hydrological Programme (IHP)

IHP is addressing the interconnected issues of water quality degradation and ecosystem degradation in various ways with the aim of contributing to the achievement of SDG 6 (Clean Water and Sanitation). It supports research, networking and capacity building initiatives aimed at improving the understanding of the interlinkages of ecohydrological processes at the catchment scale. Its Ecohydrology Programme aims to advance the integration of social, ecological and hydrological research, and to generate outcomes that enable the development of effective policies and practices for integrated water resources management, and ecosystem restoration and enhancement. For more information: <https://en.unesco.org/themes/water-security/hydrology/ecohydrology>

International Alliance of Indigenous and Tribal Peoples of the Tropical Forests

The International Alliance of Indigenous and Tribal Peoples of the Tropical Forests is a worldwide network of organisations representing indigenous and tribal peoples living in tropical forest regions (Africa, the Asia-Pacific and the Americas). Their objectives include, *inter alia*, promoting the full recognition of the rights and territories of indigenous and tribal peoples as well as promoting the development of indigenous and tribal peoples and their participation in decision- and policy-making. For more information: <https://www.forestpeoples.org/en/node/50021>

International Geoscience and Geopark Programme (IGCP)

IGCP is a global network of more than 10,000 scientists focusing on Earth sciences, which are fundamental to the protection and restoration of ecosystems. Since 1972, IGCP has been enabling research and capacity building of UN Member States in the fields of Earth resources, global change, geohazards and hydrogeology with the aim of contributing to ecosystem conservation and restoration. For more information: <http://www.unesco.org/new/en/natural-sciences/environment/earth-sciences/international-geoscience-and-geoparks-programme/>

International Indigenous Forum on Biodiversity (IIFB)

IIFB is a collection of representatives from indigenous governments, indigenous non-governmental organisations and indigenous scholars and activists that organise around the Convention on Biological Diversity (CBD) and other important international environmental meetings to help coordinate indigenous strategies at these meetings, provide advice to the government parties, and influence the interpretations of government obligations to recognise and respect indigenous rights to the knowledge and resources. For more information: <https://www.forestpeoples.org/partner/international-indigenous-forum-biodiversity-iifb>

International Land Coalition (ILC)

ILC is a global change network working with landowners and those who live on the land around the world. Over the past 25 years, ILC has become one of the foremost land rights alliances in the world, embracing over 250 organisations, including UNEP and FAO, and is based in 78 countries. ILC's diverse network bridges a wide range of views on land rights and governance, brought together with the shared goal of people-centred land governance. For more information: <https://www.landcoalition.org/en/>

International Long-Term Ecological Research Network; Project Drawdown; Natural Climate Solutions; the European Commission's Directorate-General for Research and Innovation; Economics of Land Degradation (ELD) initiative; and The Economics of Ecosystems and Biodiversity (TEEB) for Agriculture & Food.

The above-listed organisations and networks are well positioned to promote scientific research for restoring specific ecosystems, that: i) takes into account future global changes such as climate change and increased atmospheric carbon dioxide concentrations; ii) provides links between ecosystem restoration, conservation and sustainable development; and iii) informs government on policies that link to ecosystem restoration. For more information: <https://www.ilter.network/>; <https://drawdown.org/>; <https://www.naturalclimate.solutions/>; https://ec.europa.eu/knowledge4policy/organisation/dg-rtd-dg-research-innovation_en; <https://www.eld-initiative.org/>; <http://teebweb.org/agrifood/>.

International Peatland Society (IPS)

IPS is an organisation which combines all aspects related to peatlands worldwide. Through their Environment Commission and Peatland Restoration Expert Group, IPS has a large network of peatland restoration experts, covering all parts of the world, though with a focus in Europe, North America and South-East Asia. Many of IPS's other Expert Groups also provide knowledge and expertise that are crucial to restoration, including expert groups on Peatlands & Biodiversity and Peatlands & Climate Change. In addition to stakeholder dialogue, IPS works on capacity-building of local/regional communities by launching work on peatland restoration as a means to improve local/regional livelihoods, including, for example, sphagnum farming or CCS (Carbon Capture & Storage). IPS is also currently increasing their efforts towards issues related to restoration and responsible management of peatlands used for agriculture and forestry. IPS's network includes 17 national committees, over 1,400 individual members (mostly scientists) from over 40 countries, and over 300 corporate members. For more information: <https://peatlands.org/>

Italian Centre for River Restoration (CIRF)

CIRF is a non-profit organisation in Italy focussed on river restoration. Its members, which include *inter alia* engineers, biologists and agronomists, aim to develop and promote more sustainable approaches for river management and territorial planning. The organisation aims to increase the awareness on benefits of ecological river restoration, linking research with application, advocating for increased attention on these issues at local and national levels, and actively interacting with similar centres in the EU and worldwide.

CIRF carries out educational and dissemination activities and promotes and collaborates in pilot studies and innovative projects. It supports public authorities, often focusing on participatory planning and conflict resolution in the water sector and on implementation of water-related EU policies, such as the WFD and the Floods Directive. For more information: <https://www.cirf.org/en/home-9/>

IUCN Commission on Ecosystem Management

The IUCN Commission on Ecosystem Management promotes ecosystem-based approaches for the management of landscapes and seascapes, provides guidance and support for ecosystem-based management and promotes resilient socio-ecological systems to address global challenges. They have also established a Rewilding Task Force, which has created a set of rewilding principles that can inform rewilding activities under the Decade. For more information: <https://www.iucn.org/commissions/commission-ecosystem-management>

Kruger National Park Rivers Research Programme (KNPRRP)

KNPRRP was a multi-disciplinary, multi-organisational programme aimed at addressing major concerns about water quantity and quality of perennial rivers flowing through the Kruger National Park. Lessons learned from the programme are relevance for freshwater restoration initiatives. For more information: <http://www.wrc.org.za/wp-content/uploads/mdocs/TT130-00.pdf>

Lancet/EAT Foundation's "Food in the Anthropocene"

Food in the Anthropocene is a holistic approach to addressing future food supply chain options around the world, including a widespread transition to plant-based diets to reduce landscape degradation. For more information: <https://www.thelancet.com/commissions/EAT>

Lebanon Reforestation Initiative

Lebanon Reforestation Initiative is a local NGO working on ecosystem restoration in Lebanon. For more information: <https://www.lri-lb.org/>

Local and Indigenous Knowledge Systems (LINKS) programme

LINKS is a UNESCO programme to increase knowledge transmission across and within generations and find pathways to balance community-based knowledge with global knowledge in formal and non-formal education. The LINKS team brings together expertise from the natural sciences, social sciences, culture, communication and information and education. It supports the meaningful inclusion of local and indigenous knowledge in biodiversity conservation and management, and climate change assessment and adaptation. UNESCO is the convener of the Task Force on Indigenous and Local Knowledge Systems (ILK) of the Intergovernmental Platform for Biodiversity and Ecosystem Services (IPBES). For more information: <https://en.unesco.org/links>

Man and the Biosphere (MAB) Programme and the Lima Action Plan

The MAB programme is a scientific programme that has the aim of developing a better understanding of, and promoting the reconciliation between, conservation and human development. The MAB World Network of 701 sites in 124 countries, and home to over 250 million inhabitants, could be a building block and provide dedicated sites for implementation of the Decade since ecosystem restoration is one of its priority areas. The Lima Action Plan (2016–2025), which identifies ecosystem restoration as a priority action, has been approved by the MAB Governing Council and endorsed by the UNESCO General Conference. UNESCO has identified the MAB Programme as well-suited to host cross-sectoral dialogues to catalyse ecosystem restoration. For more information on the MAB Programme and the Lima Action Plan: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/Lima_Action_Plan_en_final.pdf

Man and Biosphere (MAB) Youth Network

The MAB Youth Network is a coalition of young people that has the aim of ensuring the inclusion of young people's voices in the MAB programme and the World Network of Biosphere reserves. MAB Youth representatives are talented students, young scientists, professionals, entrepreneurs and activists, all with an invaluable capacity to contribute to action in the interrelated areas of *inter alia* climate change, biodiversity conservation, sustainable use of natural resources, education for sustainable development, ecosystem restoration, and indigenous communities. For more information: <https://en.unesco.org/mab-youth>

Public-private partnership for nature conservation in El Tuparro Biosphere Reserve, Colombia

In this partnership actions are being taken to assure the maintenance of essential ecological processes and to enhance surrounding communities' well-being and welfare. Activities include combining public conservation strategies and private funding mechanisms for the conservation of 12,000 hectares of savanna and natural forest on private land, in addition to the 598,000 hectares of the biosphere reserve. For more information: <https://en.unesco.org/biosphere/lac/el-tuparro>

Reef Resilience Network

Through a growing network of managers and experts, the Reef Resilience Network connects individuals at the front lines of coral reef conservation with peers, content experts, tools, and operational knowledge to address threats and mobilise action for improved coral reef health. For more than 15 years, the Reef Resilience Network has assisted in building the capacity of marine managers to effectively manage, protect, and restore coral reefs and reef fisheries around the world. To achieve this, the network connects reef managers and practitioners with peers, experts, and the latest science and strategies, and provides online and hands-on training and implementation support. The network is a partnership led by The Nature Conservancy comprising more than 2,000 members, and supported by dozens of partners and TNC staff, as well as hundreds of global experts in coral reefs, fisheries, climate change, and communication who serve as trainers, advisors, and content reviewers. For more information: https://reefresilience.org/wp-content/uploads/Reef_Resilience_Network_Booklet_2020sm.pdf

River Restoration Centre

The River Restoration Centre is the national expert advice centre for best practice river restoration, habitat enhancement and catchment management in the UK. It provides a focal point for the exchange and dissemination of information and expertise on river restoration. The centre also provides advice on site-specific technical issues through a core team of experienced staff and a wider network of experienced river restoration practitioners. For more information: <https://www.therrc.co.uk/about-us>

Roundtable on Sustainable Palm Oil (RSPO)

RSPO has more than 4,000 members worldwide who represent all links along the palm oil supply chain. They have committed to produce, source and/or use sustainable palm oil certified by the RSPO. For more information: <https://rspo.org/>

Scaling up Biodiversity Communication for Achieving Aichi Target 1

WWF Germany runs the project "Scaling up Biodiversity Communication for Achieving Aichi Target 1" with support from the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, and funding through the International Climate Initiative. A part of this project is the "Connect2Earth" platform (<https://connect2earth.org/about-us/>) which contains open-source materials to empower people worldwide to speak up on "why nature matters" and take action for biodiversity and nature. For more information: <https://bit.ly/2Trug6t>

Sian Ka'an World Heritage Site and Biosphere Reserve (Mexico)

This world heritage site has over 15 years of experience with mangrove restoration projects supported by the World Bank. Communities have benefited from thriving bird and fish populations through mangrove restoration. For more information: <https://whc.unesco.org/en/list/410/>

Society for Ecological Restoration (SER)

SER comprises a dynamic global network of more than 3,000 members who foster the exchange of knowledge and expertise among ecological restoration practitioners and scientists from diverse disciplines and backgrounds. In addition to communicating leading-edge tools, technologies and scientific findings, SER actively promotes best practices and effective restoration policy around the world. For more information: <https://www.ser.org/>

Tree Diversity

Tree Diversity is a digital platform to integrate conservation, restoration and monitoring of tree genetic resources globally. For more information: <https://www.tree-diversity.org/>

Trillion Trees

Trillion Trees is a joint venture between BirdLife International, the Wildlife Conservation Society, and the World Wild Fund for Nature, founded on a vision of a world where tree cover is expanding rather than shrinking. It focusses on three imperatives: ending deforestation; improving protection; and advancing restoration. It connects funders with forest conservation ventures and aims to inspire society to protect and restore one trillion trees by 2050. For more information: <https://www.trilliontrees.org/>

Tsitsa Project

The Tsitsa Project is restoring degraded parts of the ~494,000 ha Tsitsa catchment in South Africa, in which two dams have been planned, to prevent sedimentation and silt build up and to improve the livelihoods of communities in the catchment. Since its inception in 2014, the Tsitsa Project has grown considerably and now aims at developing and managing both land and water in a sustainable way. For more information: https://www.ru.ac.za/media/rhodesuniversity/content/elrc/documents/2018/Tsita_Overview_Brochure_Final_English_09.10.2018_2_LowRes.pdf

UNEP #Faith4Earth Initiative

UNEP's #Faith4Earth Initiative includes faith and religious leaders that can act as restoration change-makers based on religious values. For more information: <https://www.unenvironment.org/about-un-environment/faith-earth-initiative>

UNESCO-Greece Melina Mercouri International Prize for the Safeguarding and Management of Cultural Landscapes

The prize is an example of a global awareness-raising campaign promoting the importance of landscape restoration and its contribution to the SDGs. For more information: <https://whc.unesco.org/en/culturallandscapesprize/>

UNESCO Global Geoparks

UNESCO Global Geoparks give international recognition for sites that promote the importance and significance of protecting the Earth's geodiversity through actively engaging with the local communities. Restoration has been implemented through UNESCO's International Geoscience Programme in over 70 abandoned mining sites in Global Geoparks in 29 African countries, as well as in Europe, Asia and South America. There are 147 Global Geoparks in 41 countries. For more information: <http://www.unesco.org/new/en/natural-sciences/environment/earth-sciences/unesco-global-geoparks/>

UNESCO World Heritage Sites

UNESCO World Heritage Sites promote the conservation of natural and conservation sites of outstanding universal value. These sites include iconic cases of successful restoration such as the multibillion, decade-long investment to restore the wetlands of the Everglades National Park World Heritage site. For more information: <http://whc.unesco.org/>

UNESCO World Network of Biosphere Reserves

UNESCO Biosphere Reserves focus on harmonised management of biological and cultural diversity. This network includes 701 sites in 124 countries covering all types of ecosystems on Earth, with exemplary cases of restoration such as the marine and coastal ecosystem restoration in the Seaflower Biosphere Reserve in Colombia. These sites can be useful for research and reporting of the success of ecosystem restoration. For more information: <https://en.unesco.org/biosphere>

Wadden Sea World Heritage site and Biosphere Reserve (Germany, Netherlands and Denmark)

Europe's recovery of sea grass over the last decade is in large part due to ecosystem restoration at this site. For more information: <https://whc.unesco.org/en/list/1314/> and <https://en.unesco.org/biosphere/eu-na/waddensea-schleswig-holstein>

Wetlands International

Wetlands International is a non-profit organisation dedicated to the conservation and restoration of the world's wetlands. Its mission is to sustain and restore wetlands, their resources and their biodiversity. For more information: <https://www.wetlands.org/>

World Green Infrastructure Network (WGIN)

WGIN works to raise awareness on green infrastructure, with a particular focus on urban ecosystem restoration. For more information: <https://worldgreeninfrastructurenetwork.org/>

World Heritage-listed coral reefs

Managers of World Heritage-listed reefs are deploying the latest scientific techniques to restore corals. For example, restoration scientists in the Great Barrier Reef (Australia) are applying the latest scientific techniques to restore coral reefs, upon which many Aboriginal peoples depend, by using submersible robots, which disperse coral larvae and conduct coral transplants. For more information: <https://www.icriforum.org/key-topics/world-heritage-marine-programme/>

World Vision International

World Vision International focusses on vulnerable children and communities worldwide. The organisation recognizes the essential role of a healthy natural environment in child well-being, and of the impact of climate change and other environmental issues on disadvantaged communities. It has been involved in numerous restoration projects in developing countries around the world, including farmer-managed natural regeneration of woodlands in Africa. For more information: <https://www.worldvision.com.au/global-issues/work-we-do/climate-change/why-world-vision-cares-about-the-environment>

Xingu Seed Network

The Xingu Seed Network has brought together over 600 seed collectors and contributed to the recovery of 6,600 hectares of degraded land. For more information: <https://ser-insr.org/news/2017/9/15/xingu-seeds-network-in-brazil>; https://www.socioambiental.org/sites/blog.socioambiental.org/files/blog/pdfs/p4f_0454_arsx_ta_v23_itt.pdf

Young Champions of the Earth initiative

A partnership between CoalitionWILD, UN Environment, and Covestro, “Young Champions of the Earth” (#YoungChamps) aims to celebrate and support individuals between the ages of 18 and 30 who have outstanding potential to create positive environmental impact. Along with receiving the prestigious award, winners receive seed funding, intensive training, and tailored mentorship to help bring big environmental ideas to life. For more information: <https://www.unenvironment.org/youngchampions/#:~:text=Young%20Champions%20of%20the%20Earth%20is%20a%20forward%20looking%20prize,young%20environmentalists%20aged%2018%20%2D%202030>

Education programmes

The Center for Capacity Development (GRÓ)

The GRÓ has training programmes in four areas of expertise: geothermal energy, gender equality, fisheries, and land restoration. For more information: <https://www.grocentre.is/>

Collaborative Partnership on Forests' Joint Initiative on a Global Forest Education Platform

This project brings together different perspectives of the educational environment. Non-governmental organisations, researchers and students collaborate within the project to shape the future of forest education. They apply innovative methods and new ways to prepare for a bright future for the forest sector. For more information: <https://foresteducation.wordpress.com/2020/01/24/creation-of-a-global-forest-education-platform-and-launch-of-a-joint-initiative-under-the-aegis-of-the-collaborative-partnership-on-forests-cpf-2019/>

Education for Sustainable Development (ESD) for 2030

The ‘ESD for 2030’ framework, which UNESCO Member States adopted for the period 2020–2030, focusses on five priority actions areas, namely: i) advancing policy; ii) transforming education institutions; iii) building the capacities of educators; iv) empowering and mobilising youth; and v) taking action in local communities. Most expected activities under the framework will have the potential to contribute to ecosystem restoration.

The framework has the objective of building a more just and sustainable world through strengthening ESD and contributing to the achievement of the 17 Sustainable Development Goals. It seeks to reorient education and learning to contribute to sustainable development and to strengthen education in all activities that promote sustainable development. The framework will focus on integrating ESD and the 17 SDGs into policies, learning environments, capacity building of educators, empowerment and mobilisation of youth, and local level action. For more information: <https://www.oneplanetnetwork.org/initiative/education-sustainable-development-towards-achieving-sustainable-development-goals-esd>

Higher Education Sustainability Initiative (HESI)

HESI is a partnership between the United Nations Department of Economic and Social Affairs, UNESCO, UNEP, UN Global Compact’s Principles for Responsible Management Education initiative, the United Nations University, UN-HABITAT, UNCTAD and UNITAR. It was created in 2012 in the run-up to the United Nations Conference on Sustainable Development (Rio+20). All higher education institutions may join the network freely. Higher education institutions part of HESI commit to: teach sustainable development across all disciplines of study; encourage research and dissemination of sustainable development knowledge; green campuses and support local sustainability efforts; and engage and share information with international networks. HESI can support the integration of ecosystem restoration into higher education programmes globally. For more information: <https://sustainabledevelopment.un.org/sdinaction/hesi>

One UN Climate Change Learning Partnership (UN CC:Learn)

UN CC:Learn is a joint initiative of more than 30 multilateral organisations helping countries to achieve climate change action both through general climate literacy and applied skills development. The initiative provides strategic advice and quality learning resources to help people, governments and businesses to understand, adapt, and build resilience to climate change. For more information: <https://unccelearn.org/>

UN University's Land Restoration Training Programme

This programme supports the integration of ecosystem restoration into education at all levels and in all settings. For more information: <https://www.grocentre.is/lrt>

UNESCO Associated Schools Network

The UNESCO Associated Schools Network is supporting the integration of ecosystem restoration into education as part of its promotion of a whole school approach to sustainability. For more information: <https://aspnet.unesco.org/en-us>

UNESCO Global Network of Learning Cities (GNLC)

GNLC is an international policy-oriented network providing inspiration and best practice. The network supports the achievement of all 17 SDGs, in particular SDG 4 ('Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all') and SDG 11 ('Make cities and human settlements inclusive, safe, resilient and sustainable'). GNLC supports and improves the practice of lifelong learning in the world's cities by: promoting policy dialogue and peer learning among member cities; forging links; fostering partnerships; providing capacity development; and developing instruments to encourage and recognize progress made in building learning cities. For more information: <https://uil.unesco.org/lifelong-learning/learning-cities>

UNESCO Institute for Long Life Learning (UIL)

UIL will hold the 7th International Conference on Adult Education (CONFITEA VII) in 2022, which is a UNESCO-led intergovernmental conference for policy dialogue on adult learning and education (ALE) and related research and advocacy. It provides a platform for debating the latest developments in youth and adult learning and education, as well as the UN Decade on Ecosystem Restoration. It will encourage Member States to put in place regulatory frameworks to develop opportunities for living and acting in a culture of human rights, values, and ecological and climate sustainability. Participants will elaborate a set of recommendations for ALE's further development, which will contribute to the CONFITEA VII outcome document – a new framework for action that participating countries will commit to for the next 12 years in order to guide policy and practice on ALE while realising the 2030 Sustainable Development Agenda.

UIL regularly publishes the Global Report on Adult Learning and Education (GRALE) that monitors adult learning and education in all UNESCO Member States and aims to make policymakers, researchers, facilitators and other stakeholders aware of the developments of adult learning and education. The fifth issue of GRALE is currently under preparation and it focuses on citizenship education, which is relevant to the realisation of the 2030 Agenda for Sustainable Development. The three areas of sustainability, namely economic growth, social inclusion and environmental protection, rely on the contribution of informed citizens, a core objective of the UN Decade. The latest GRALE can be downloaded here: <https://uil.unesco.org/uils-annual-report-2019>

UNESCO Intergovernmental Oceanographic Commission's Ocean Literacy Programme

In 2019, UNESCO's Intergovernmental Oceanographic Commission (IOC) launched its Ocean Literacy programme, including an online portal to promote awareness and exchange of knowledge, and a teaching guide and toolkit to mainstream ocean literacy into schools worldwide. Promoting Ocean Literacy is one of UNESCO's goals for the Decade of Ocean Science for Sustainable Development (2021–2030). For more information: <https://oceanliteracy.unesco.org/>

Policies and conventions

Convention on Biodiversity (CBD) Post-2020 Biodiversity Framework and other biodiversity-related conventions

The Decade will contribute to the goals of the CBD Post-2020 Biodiversity Framework (<https://www.cbd.int/conferences/post2020>), making all biodiversity-related conventions integral to the Decade's implementation. Examples include the Convention on the Conservation of Migratory Species of Wild Animals, Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the International Treaty on Plant Genetic Resources for Food and Agriculture. For more information: <https://www.cbd.int/brc>

European Union's Birds and Habitats Directives

The EU Birds and Habitats Directives is a regional tool to inform conservation and restoration in Europe. For more information: <https://ec.europa.eu/environment/nature/info/pubs/docs/brochures/nat2000/en.pdf>

European Union's Marine Strategy Framework Directive

The aim of the European Union's Marine Strategy Framework Directive is to more effectively protect the marine environment across Europe. It also has scope to help inform marine restoration projects in European oceans. For more information: <https://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/marine-strategy-framework-directive/>

European Union's Roadmap to a Resource Efficient Europe

The EU Roadmap to a Resource Efficient Europe outlines approaches to transforming Europe's economy into a sustainable one by 2050. It proposes ways to increase resource productivity and decouple economic growth from resource use and its environmental impact. For more information: https://ec.europa.eu/environment/resource_efficiency/about/roadmap/

Global Wetlands Outlook

The Global Wetlands Outlook is Ramsar's flagship report on the global status of wetlands. For more information: <https://www.global-wetland-outlook.ramsar.org/>

Integration of a Sustainable Development Perspective into the Processes of the World Heritage Convention

This policy document for the Integration of a Sustainable Development Perspective into the Processes of the World Heritage Convention highlights how the World Heritage Convention, in itself, contributes significantly to sustainable development and the wellbeing of people. It encourages a recognition of the close links and interdependence of biological diversity and local cultures within the socio-ecological systems of World Heritage sites. For more information: <https://whc.unesco.org/en/sustainabledevelopment/>

IUCN World Heritage Convention

The World Heritage Convention has the mission of identifying and protecting the world's most important natural and cultural heritage sites. For more information: <https://www.iucn.org/theme/world-heritage/about/world-heritage-convention>

Local Biodiversity Outlooks

Local Biodiversity Outlooks highlights how indigenous peoples and local communities contribute to the biodiversity conservation. For more information: <https://beta.localbiodiversityoutlooks.net/> and <https://www.cbd.int/gbo/gbo4/publication/lbo-en.pdf>

UN Decade on Ocean Science for Sustainable Development

The UN Decade on Ocean Science for Sustainable Development could act as a vehicle for generating the scientific evidence needed for achievement of the Decade on Ecosystem Restoration's vision with regards to coastal and marine ecosystems. Potential actions include: convene stakeholders around actions related to marine and coastal ecosystem restoration; facilitate work on sustainable production and food security; conduct research related to marine ecosystem restoration under changing climatic conditions, technological innovations, and social sciences (e.g. governance, resource access rights, maximising science-to-policy uptake); host a joint event in 2021 to celebrate both Decades, highlighting the challenge of finding and implementing science-based solutions for the restoration of marine ecosystems (followed by other joint events throughout the Decade); write a joint publication in 2021 or 2022, potentially in sync with the joint launch event, highlighting the complementarity in the Decades and launching the social media campaign (#GenerationRestoration can be promoted alongside #GenerationOcean); share data, both in terms of data generated through the Ocean Decade being used for restoration action, and for data from monitoring of restoration activities being used to inform research and knowledge generation; include Ocean Literacy concepts in education, training and capacity-building activities; endorse joint flagship initiatives and actions; and collaborate on joint resource mobilisation efforts. For more information: <https://en.unesco.org/ocean-decade>

New York Declaration on Forests

The New York Declaration on Forests is a voluntary and non-binding international declaration to take action to halt global deforestation. It was first endorsed at the United Nations Climate Summit in September 2014. As of September 2019, the list of NYDF supporters had grown to include over 200 endorsers: national governments, sub-national governments, multi-national companies, groups representing indigenous communities, and non-government organisations. For more information: <https://forestdeclaration.org/>

Ramsar Strategic Plan 2016–2024

The Ramsar Strategic Plan has the goals of: addressing drivers of wetland loss and degradation; and effectively conserving, managing and using all Ramsar wetlands. For more information: https://www.ramsar.org/sites/default/files/hb2_5ed_strategic_plan_2016_24_e.pdf

Regional Sea Programmes/Conventions

Regional Sea Conventions can play an important role in synthesising and disseminating lessons learned from experiences in coastal and marine ecosystems restoration. For more information: <https://www.unenvironment.org/explore-topics/oceans-seas/what-we-do/working-regional-seas/regional-seas-programmes> and https://ec.europa.eu/environment/marine/international-cooperation/regional-sea-conventions/index_en.htm

SIDS UNESCO Action Plan

Small Island Developing States (SIDS) face constant exposure to natural disasters, which puts considerable pressure on their ecosystems. The SIDS UNESCO Action Plan highlights how SIDS Member States need assistance in enhancing their scientific and technical capacity for ecosystems restoration. For more information: <http://www.unesco.org/new/en/natural-sciences/priority-areas/sids/resources/publications/unesco-sids-action-plan/>; <https://unesdoc.unesco.org/ark:/48223/pf0000246082>

UN New Urban Agenda (Resolution 71/256)

A 2016 resolution adopted by the UN General Assembly committing to the sustainable development of cities over the coming decades. For more information: https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_71_256.pdf

UN Strategic Plan for Forests 2017-2030

The Global Forest Goals and targets of the UN Strategic Plan for Forests 2017-2030, adopted by the UN Forum on Forests and subsequently by the UN General Assembly, includes a target to increase forest area by 3 per cent globally by 2030. For more information: https://www.un.org/esa/forests/wp-content/uploads/2017/09/UNSPF-Briefing_Note.pdf

Footnotes

- 1 <http://www.djadjawurrung.com.au/wp-content/uploads/2015/11/Dja-Dja-Wurrung-Country-Plan.pdf>
- 2 IPCC. 2018. Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. Available at: https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Full_Report_High_Res.pdf
- 3 see e.g. <https://www.ecologyandsociety.org/vol24/iss3/art6/ES-2019-10855.pdf>
- 4 https://postconflict.unep.ch/publications/EcoDRR_Opportunity_Mapping.pdf
- 5 <https://oceanwealth.org/explore-the-mangrove-restoration-potential-mapping-tool/>

