Strategy of the United Nations Decade on Ecosystem Restoration

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Executive Summary: The UN Decade on Ecosystem Restoration

The objectives of the 2030 Agenda for Sustainable Development are ending poverty, conserving biodiversity, combating climate change and improving livelihoods for everyone, everywhere. These objectives 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 an investment contribute to achieving the Sustainable Development Goals, but it would also yield considerable economic returns. Based on data from a wide range of ecosystems, for every dollar spent on restoration, at least nine dollars of economic benefits can be expected. The 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. It will do so by supporting and inspiring governments, NGOs, civil society, children and youth, private sector companies, indigenous peoples, 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: constructing a digital hub for sharing knowledge and starting 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 new ethical imperative to conserve, restore and care for nature; undertaking scientific research on restoration in terrestrial as well as marine environments; and building the technical capacity of restoration practitioners globally.

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, with the primary aim being to *prevent, halt and reverse the degradation of ecosystems worldwide*. Conservation of biodiversity and the sustainable use of natural resources are essential for reaching that aim.

2. In the context of the Decade, ecosystem restoration refers to a wide continuum of practices and targeted ecosystem conditions that contribute to conserving and repairing damaged ecosystems[1], including, for example, the restoration of organic carbon in agricultural soils, recovery of overfished stocks, remediation of polluted sites, restoration of ecosystem services, and restoration of biodiversity to a state similar to that prior to degradation. Crucially, restoring ecosystems increases the supply and quality of ecosystem services over time towards desired states which support national sustainable development priorities. The resolution highlights that the numerous benefits accruing from such desired states can play a major role in achieving the objectives of the 2030 Agenda for Sustainable Development, namely ending poverty, conserving biodiversity, combating climate change and improving livelihoods for everyone, everywhere. Indeed, efficient and sustainable ecosystem restoration, complemented by conservation, is uniquely positioned as an intervention that can make major contributions to all 17 Sustainable Development Goals (SDGs)[2]. Ecosystem restoration will increase Life Below Water (SDG 14) and Life on Land (SDG 15), which in turn will 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 will also provide: work opportunities and income streams (SDGs 1, 5, 8, 10); cross-sectoral collaboration, learning and innovation on the use of ecosystem goods and services (SDGs 4, 7, 9, 16, 17); and nature-based solutions for mitigating and adapting to climate change (SDG 13).

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
2. IRP. 2019. Land Restoration for Achieving the Sustainable Development Goals. An International Resource Panel Think Piece. United Nations Environment Programme, Nairobi, Kenya
   IPBES. 2018. The IPBES assessment report on land degradation and restoration. Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, Bonn, Germany
   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.

b) Role of the UN Member States

3. UN Member States were encouraged in the resolution to support the Decade by building a new momentum for ecosystem restoration globally, scaling up existing ecosystem restoration efforts, raising awareness of the importance of restoration, and building synergies between agriculture, urban development, conservation and restoration initiatives. With this support, the Decade is expected to contribute not only to progress on the 2030 Agenda for Sustainable Development, but also to achieving 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 Bonn Challenge's target of restoring 350 million hectares of degraded land, as well as the goals of the post-2020 global biodiversity framework under the Convention on Biological Diversity (CBD).

4. The resolution requests that, in support of the Decade, Member States foster political will, mobilise resources, build capacities, mainstream ecosystem restoration into national policies and plans, implement plans to prevent ecosystem degradation, and undertake collaborative scientific research. The strategic approach and suggested activities for the Decade were further developed over the period March 2019 to January 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. These consultations were conducted through workshops, meetings, conference calls, and engagements on the side of the Rio Convention meetings[3]. This strategy document is based on an analysis of all information received during the consultations. Its purpose is to build support amongst all Member States, to promote broad participation within the Decade, and to inspire stakeholders across the world to take actions to make the Decade a success.

2. Vision and theory of change

5. The overarching vision for the Decade is a world where – for the health and wellbeing of all life on earth and that of future generations – we have restored the relationship between humans and nature, by increasing the area of healthy ecosystems, and by putting a stop to their loss and degradation. Underpinning this vision are two main goals, namely: enhancing global, regional, national and local commitments and actions to prevent, halt and reverse the degradation of ecosystems; and increasing and applying our understanding of successful ecosystem restoration in our education systems and within all public and private sector decision-making. An underlying premise of the Decade's strategy is that once societies across the world are fully aware of the wide range and magnitude of benefits accruing from ecosystem restoration, enabling conditions will be developed, and resources within the public as well as private sectors will be deployed, to prevent degradation of ecosystems and to restore ecosystems to the extent that there are major positive impacts on the well-being of current as well as future generations.

6. To achieve its vision, the Decade will need to work with a wide range of stakeholders to systematically overcome the barriers that currently prevent long-term decision-making on the use of natural resources – in urban, suburban, industrial, rural or marine environments – being underpinned by thorough analyses of all the social, economic and environmental benefits emanating from ecosystem restoration. The barriers will vary markedly according to the ecosystem being restored and the local context. Consequently, each Member State and each local community will need to undertake careful national and local analyses. All relevant stakeholders – including for example, national and local government departments, NGOs, the private sector, academia, civil society, women's groups, faith groups, indigenous peoples' groups and youth organisations – will then need to collaborate to overcome the barriers and catalyse meaningful upscaling of ecosystem restoration. The Decade's role will be to support these stakeholders in coordinating their activities and ensuring that the best available scientific evidence, policy options, enabling mechanisms, incentives, synergies with other initiatives, and tools are available for overcoming the barriers. It will provide an umbrella structure under which all relevant

3. >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.

stakeholders and initiatives can constructively engage and move together towards a common global vision of restoring hundreds of millions of hectares of currently degraded ecosystems, within terrestrial, freshwater and marine environments.

a) Barriers

7. The main barriers to the Decade's vision are inter-related and overlapping but can be broadly categorised into: public awareness and societal mindsets; political will; legislative and policy environments; technical capacity; research and development; and financing. The global public is largely unaware of the extent to which ecosystem degradation is impacting the well-being and livelihoods of billions of people[4,5], the costs of this degradation[6], and the profound benefits that would accrue with major investments in ecosystem restoration[7]. As a result of this general lack of awareness (together with other barriers outlined in Annex 1), there is insufficient political will within society to motivate societal leaders to invest considerable amounts of public and private resources into ecosystem conservation and restoration. Such investments would include: developing technical capacity of a wide range of stakeholders; undertaking long-term scientific research that informs the design of effective ecosystem restoration techniques at site level; catalysing ecosystem restoration initiatives through changes in policies, regulations, legislation, tax incentives and subsidies; developing new financial mechanisms for supporting ecosystem restoration; and using public as well as private finance to implement ecosystem restoration across vast landscapes and seascapes.

b) Pathways

8. Each of the above-mentioned barriers is a function of numerous factors, which are summarised in Annex 1. These factors will all be taken into careful account during the course of the Decade. The theory of change of the Decade's strategy is structured in such a way that the barriers are systematically overcome through a collaborate effort of all stakeholders involved to develop a global restoration economy. This collaboration will take place along three main pathways, namely generating a global movement, fostering political support and building technical capacity (see Figure 1).

9. Pathway I, the generation of a global movement, including many linked local networks, will focus on shifting societal norms and behaviours regarding ecosystem restoration. The aim will be to increase the intent of societies worldwide to restore degraded landscapes on a large scale. Such restoration could be achieved through single investments in large areas of hundreds of thousands of hectares, or many smaller initiatives that, in total, coalesce to result in a considerable increase in the supply of ecosystem goods and services in a particular location. Barriers to be overcome in Pathway I relate to the many current social norms and behaviours that result in ecosystem degradation and impede ecosystem restoration, 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. A digital hub will be established in Pathway I that provides: targeted calls to action for shifting societal norms and behaviours; two-way flows of information between the Decade's stakeholders; peer-to-peer learning; a platform for restoration practitioners to connect with investors and funders; compendiums of best practices in different ecosystems; and a tracking of current and past ecosystem restoration initiatives across the world. UNESCO, together with other Decade partners, will embed ecosystem restoration into primary, secondary and tertiary education systems globally, by adjusting curricula as well as introducing extra-curricular activities.

4. IPBES. 2018. The IPBES assessment report on land degradation and restoration. Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, Bonn, Germany.
5. 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.
6. 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
7. The Economics of Ecosystems and Biodiversity. 2015. TEEB for Agriculture & Food: Toward a Global Study on the Economics of Eco-Agri-Food Systems. Geneva: UN Environment. Available from http://www.teebweb.org/wp-content/uploads/2013/08/Towards-TEEBAgFood_15May2015.pdf

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) 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.

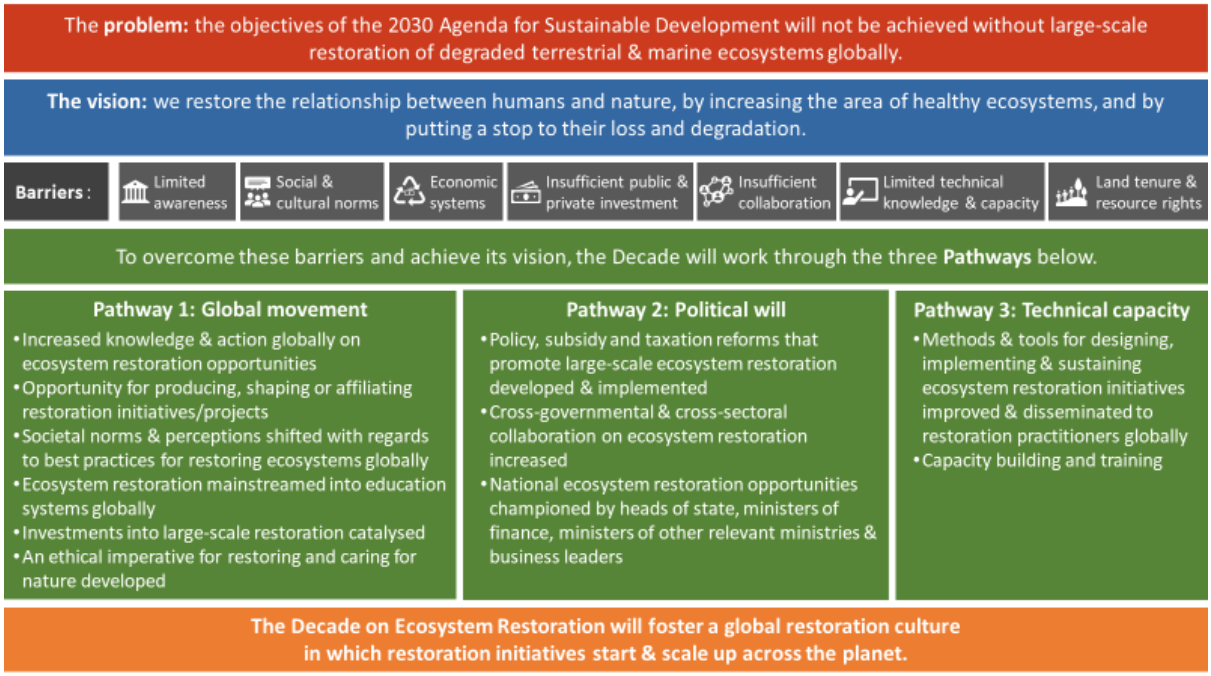

Figure 1. Theory of change for the UN Decade on Ecosystem Restoration

10. Pathway II, the fostering of political support, will focus on assisting *inter alia* heads of state, ministers of finance, ministers of other relevant ministries as well as business leaders to champion restoration in their respective Member States. The aim will be to change legislative, regulatory and policy frameworks in order to reduce degradation of ecosystems and catalyse ecosystem restoration. Pathway I links into Pathway II in that increased political support will also be garnered by an increase in the global public's commitment to upscaling ecosystem restoration. Barriers to be overcome in Pathway II relate to: the perceived financial risks of ecosystem restoration; insufficient security of tenure and resource rights of local communities; policy environments that do not incentivise ecosystem restoration entrepreneurs; a limited technical understanding of ecosystem restoration by policymakers; and the difficulty of encapsulating the diverse array of benefits from restoration into a simple narrative to act upon.

11. Dialogues on ecosystem restoration will be facilitated within Pathway II, across sectors, within and across governments, and within the private sector, on what interventions are necessary to embark on restoration within a particular country. Subjects covered in these dialogues will include *inter alia*: redirecting fossil fuel, agricultural and fishing subsidies to conservation and ecosystem restoration; supporting small medium and micro enterprises (SMMEs) within value chains that promote ecosystem restoration; developing land tenure and fisheries management systems that incentivise individuals and local communities to make long-term investments in ecosystem protection and restoration; promoting cleaner production methods that reduce the amount of pollutants entering freshwater systems; investing in research and development to maximise returns from restoration of specific local ecosystems; introducing legislation, policies and/or regulations that incentivise the private sector to invest in ecosystem restoration; ensuring that ecosystem restoration is central to all resource use planning processes; demonstrating linkages between ecosystem restoration and the targets of multilateral environmental agreements; engaging civil society actors, including especially youth organisations,

in their national policy planning and implementation; training government staff in public policy schools on ecosystem restoration; and incorporating data on ecosystem restoration into routine national accounting.

12. Pathway III, the building of technical capacity, will focus on providing the best available methods for designing, implementing and sustaining ecosystem restoration initiatives to institutions involved in ecosystem restoration as well as individual restoration practitioners globally. The aim will be to increase the role of science, indigenous knowledge and traditional practices – using appropriate institutional mechanisms – in upscaling ecosystem restoration globally. A wide range of disciplines will be engaged to overcome barriers relating to social, economic, environmental, institutional and managerial factors constraining ecosystem restoration. Tools for monitoring and evaluating, conducting baseline studies, undertaking primary research, and developing site specific ecosystem restoration protocols will be disseminated via the Decade's digital hub. Training courses on upscaling ecosystem restoration will also be developed and conducted for a wide range of stakeholders including *inter alia*: restoration practitioners; politicians; schoolteachers; university lecturers; researchers; indigenous peoples; local community trainers; government technicians; and youth.

3. Implementation

13. The majority of activities contributing to the Decade's vision – to restore the relationship between humans and nature and to capitalise on the opportunities presented by ecosystem restoration – will be undertaken by governments (at national, subnational and local levels) and stakeholders such as NGOs, private sector companies, academic institutions, civil society, women's groups, faith groups, indigenous peoples' groups and youth organisations. It is also envisaged that individuals, both within and outside of organisations, will volunteer their expertise and time to catalyse and implement the many hundreds of thousands of initiatives that will contribute to achieving the overarching vision of restoring the relationship between humans and nature. UNEP and FAO, as the lead implementing UN agencies of the Decade, will facilitate collaboration amongst governments and all other stakeholders (including organisations and individuals) wherever feasible. Examples of activities that the Decade's stakeholders may consider undertaking are presented in Annex 2.

14. Many of the activities within the Decade will be building on prior and existing initiatives. An important role of the Decade will be to assist stakeholders in identifying such initiatives and supporting their expansion in ways that optimise resource use and prevent unnecessary duplication. All initiatives seeking to contribute to the Decade's vision will be welcomed as partners. Sections 3a-c below outline how the three pathways of the Decade will be implemented and provide examples of such initiatives. Additional initiatives that have activities anticipated to be of central importance to the Decade are currently being compiled in an annex which will be shared online during the first quarter of 2020. The Decade's 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

15. The Decade will use, amongst other tools, a digital hub and social media to develop a global movement of organisations and individuals that collaborate to catalyse ecosystem restoration. This will include *inter alia* generating and sharing information, raising funding, 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 academics, ecosystem restoration practitioners and the general public. Webinars will be used to build capacity on specific technical topics, such as restoration protocols in different ecosystems, 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 also enable local ecosystem restoration initiatives to be showcased and recognised on the international stage. In so doing, the Decade will assist in elevating the prominence of such initiatives amongst local decision-

makers and communities by showing how their local activities are contributing to global objectives such as the SDGs.

16. It is envisaged that the Decade's 'calls to action' will result in local activities coordinated by volunteers (individuals and organisations) in an informal and spontaneous manner, including peer-to-peer learning. The motivations for volunteers to dedicate time to advancing the Decade's vision will vary, but are expected to all 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) and to safeguard the well-being and livelihoods of current as well as future generations. The Decade 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 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 to explore the restoration potential of a particular landscape.

17. Youth organisations will be particularly instrumental in galvanising a global movement given their presence at a local level, and their strong role in social media trends and activities. The digital hub will consequently have a dedicated section 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.

18. The digital hub will also be used to coordinate activities that have regional or global application. Examples include: development of smartphone applications that generate data on the ecosystem restoration achieved and facilitate the purchase of the resultant ecosystem services from restoration practitioners; development of modules in video games that feature ecosystem restoration; development of school lessons on ecosystem restoration for teachers to integrate into science or geography curricula; facilitation of dialogues between stakeholders in different sectors – such as agriculture, water, energy, finance, infrastructure and conservation – to reach consensus on how to develop land use plans that maximise ecosystem restoration benefits for society; and showcasing of bankable business plans to enable investors in ecosystem restoration to connect with implementers.

Developing an ethical imperative

19. 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, norms and aesthetics are of fundamental importance. It is envisaged that a wide range of opinion-makers – including artists, musicians, poets, comedians, cultural icons, religious leaders, scientists, philosophers, and other thought leaders – will collaborate under the umbrella of the Decade to detail an ethical imperative for managing ecosystems and economies globally. This imperative is expected to focus on the positive effects of ecosystem restoration and conservation on the well-being of individuals globally (e.g. a new relationship with nature that results in improved livelihoods and health for current and future generations) and to complement existing belief systems. It is also envisioned that the imperative will ultimately stand alongside other commonly accepted principles such as democratic governance, human rights and gender equity. Once societies fully adopt the concept that all individuals should enjoy the benefits of healthy ecosystems in their local environments, major investments in ecosystem restoration will become an established ongoing norm, rather than an occasional event.

20. Faith-based and cultural organizations are already playing a crucial role in promoting a culture of stewardship of nature and ecosystem restoration globally. Many governments are also actively promoting ethical 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 2020.

Engaging individuals

21. Although governments, UN agencies, international NGOs and large corporations will support and guide the Decade, and lead many of its activities, it is envisaged that small NGOs and businesses, as well as hundreds of millions of individuals, from school children to the elderly, will help develop and take ownership of the initiatives, ideas and imperatives catalysed within the Decade. Individuals can make a contribution to fulfilling the Decade's vision, whether it be through writing, painting, drawing, speaking, philosophising, funding, analysing, planting, seeding, cultivating, watering, teaching, voting, campaigning, mobilising, raising awareness or collaborating. The Decade's digital hub will have a section dedicated to showcasing individual champions and awarding prizes for particularly outstanding contributions.

Partnering with youth

22. Young people are agents of change. This is evident in how the youth have mobilised in the past few years to support action on climate change and nature-based solutions. Youth organisations across the world are already championing the Decade and encouraging their members to catalyse ecosystem restoration initiatives. For example, over the period September to December 2019, youth consultations on the Decade were held in 25 locations, across 19 countries and 5 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 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 green jobs workforce; and undertaking on-the-ground ecosystem restoration initiatives in their local neighbourhoods.

23. During the course of the 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

24. 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. 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 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, the Decade will enable children between the ages of 6 and 8 years in 2021 to have received at least ten years of education on ecosystem restoration by 2030. Careful design of lessons on ecosystem restoration for different age groups will ensure that each year of education adds new layers to a child's understanding, so that by the time s/he leaves school, s/he is in a position to form sophisticated views on where society should be allocating its resources in terms of restoring ecosystems. The social media hashtag for encouraging school children to join the Decade's global movement on ecosystem restoration is anticipated to be #restorationgeneration.

25. The Decade will promote many diverse ways of educating not only children, but also adults, on the benefits of ecosystem restoration. First, it is anticipated that 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, and the United Nations University's Land Restoration Training Programme) will 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) will be used and adjusted by the Decade's stakeholders. Lastly, it is expected that local NGOs will 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 science, geography, literature, poetry and maths.

Showcasing flagship initiatives

26. Existing ecosystem restoration initiatives around the world will be an important source of information for the Decade's stakeholders. The barriers encountered, as well as successes achieved, in such initiatives will be systematically analysed and shared, enabling new initiatives to optimise their approaches based on worldwide experiences to date. Examples of existing ecosystem restoration initiatives that will potentially provide such information include those in: the Atlantic Forest in Brazil; coral reefs in Indonesia; 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 of Louisiana, USA; 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; and freshwater lakes in Canada. These examples represent a small fraction of the world's restoration initiatives which could provide critical information for guiding future upscaling of ecosystem restoration. During the course of the Decade, a systematic study and promotion of ecosystem restoration initiatives will be conducted in order to compile a database of such information and to identify flagship initiatives that are leading the way in terms of exemplary practices. There will be a range of criteria for flagship initiatives, including, for example, a potential minimum size of 1 million hectares, government endorsement, activities that fall within the continuum of ecosystem restoration practices developed by the Society for Ecological Restoration[8], frequent cross-sectoral dialogues amongst stakeholders; and potential for replication and further upscaling.

27. The Great Green Wall of the Sahel, in particular, provides the Decade with an opportunity to learn from many linked restoration initiatives that have occurred over the past two decades, stretching over 8000 kilometres through 11 countries, and covering a diverse range of ecosystems, including desert, savanna, woodland and forest. Lessons learned from the Great Green Wall initiative on large-scale ecosystem restoration initiatives (which are mirrored in many other initiatives globally, such as REDD+ projects[9]), include the need for *inter alia*: implementing environmental and social safeguards to prevent unintended negative consequences of the proposed interventions; ensuring that free, prior and informed consent is received from local communities and/or indigenous peoples; undertaking detailed land use planning with local communities and/or indigenous peoples prior to on-the-ground implementation; obtaining and clearly defining resource rights for local communities and/or indigenous peoples; employing horticultural expertise for propagation of seeds and plants in nurseries; and using knowledge on the local botany and soil properties for selecting appropriate species to be used in the ecosystem restoration.

Laying post-2030 foundations

28. 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 Decade's initiatives beyond 2030, with mechanisms in place to ensure maintenance and upscaling through the course of

8. Gann et al. 2019. International principles and standards for the practice of ecological restoration. Second edition. Restoration Ecology DOI:10.1111/rec.13035
9. REDD+ are the efforts under the UN Framework Convention on Climate Change for reducing emissions from deforestation and forest degradation in developing countries.

the 21st century. Assuming that the 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 Decade's initiatives will be self-sustaining and will expand after 2030. 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 throughout the course of the Decade.

b) Pathway II: generating political support

Engaging heads of state and ministers

29. Heads of state, ministers of finance, ministers from a wide range of other government departments and business leaders will be supported by the Decade to champion ecosystem restoration through, for example, changes to national accounting systems, fiscal policies, land tenure systems, and fisheries management systems. A wide range of initiatives are well positioned to provide such support. Initiatives like the United Nations System of Environmental-Economic Accounting (SEEA) advise governments on how to include data on agriculture, forestry, 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. It is consequently anticipated that 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. With regards to land tenure and fisheries management systems, in 2012, the Committee on World Food Security (CFS) – an international and intergovernmental platform, which reports to the UN General Assembly – 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 Decade will seek to build on these guidelines by identifying opportunities to include ecosystem restoration in their implementation worldwide.

Convening cross-sectoral dialogues

30. A wide range of initiatives, networks and organisations are well positioned for hosting cross-sectoral dialogues to catalyse ecosystem restoration and/or providing guidance to the Decade's stakeholders on how to host such dialogues. Examples include: the Global Partnership on Forest and Landscape Restoration; 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 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); and UNESCO's Man and the Biosphere (MAB) Programme (with its 701 sites in 124 countries globally).

Unlocking finance

31. The scale of investment in ecosystem restoration required for a substantial global impact is likely to exceed one trillion US dollars in total[10,11]. By comparison, 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

10. 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
11. The total cost of fossil fuel subsidies globally, when taking externalities into account, is estimated to be USD 5.3 trillion per year. See Coady 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.

benefits from ecosystem restoration, investing one trillion US dollars in ecosystem restoration over the period of a decade is prudent and realistic[12]. Indeed, it is a relatively modest starting point (~0.1% of expected global GDP over the course of the Decade[13]), with larger amounts expected to be allocated once societies start to experience the returns on investments in ecosystem restoration[14]. Benefit:cost ratios of at least 1:9 can be expected, based on analyses of existing ecosystem restoration initiatives across a wide range of ecosystems[15].

32. Numerous existing coalitions and forums are well positioned to assist governments to make 'fast and fair' changes to 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) of the subsidies, taxations and regulations. Such changes would result in redirected subsidies catalysing ecosystem restoration on a vast scale of hundreds of millions of hectares. Examples of suitable coalitions and forums to catalyse these changes include: the Coalition of Finance Ministers for Climate Action; the Conference of African Ministers of Finance, Planning and Economic Development; 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); and the FAO training programmes for parliamentarians on sustainable food systems.

33. With regards to the private sector, a critical role for large corporations, small businesses and individual entrepreneurs with the Decade will be to develop bankable business plans for restoration initiatives that take into account the full suite of benefits expected over the long-term. In some landscapes, bankable 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 goods (e.g. increased revenues from tourism and agricultural operations). In these cases, public private partnerships will need to be developed through intensive collaboration between ministries of finance and the private sector.

c) Pathway III: building technical capacity

Deploying science and technology in ecosystem restoration

34. The Decade's stakeholders will be encouraged to provide technical support to ecosystem restoration initiatives globally by providing scientific guidance, undertaking research, deploying technology where feasible, guiding policymakers on best practices, and taking indigenous knowledge and traditional practices into account when designing restoration interventions. Numerous organisations and networks are well positioned to promote scientific research that *inter alia*: hones protocols for restoring specific ecosystems, taking into account future global changes such as climate change and increased atmospheric carbon dioxide concentrations; quantifies benefits to society from ecosystem restoration; provides links between ecosystem restoration, conservation and sustainable development; and informs government policies that link to ecosystem restoration. These include, for example: the International Long-Term Ecological Research Network (which has over 800 sites in almost every biome on Earth); Project Drawdown; the Natural Climate Solutions Initiative; the European Commission's Directorate-General for Research and Innovation; the Economics of Land Degradation (ELD) initiative; and The Economics of Ecosystems and Biodiversity for Agriculture & Food. An FAO-led Task Force has been

12. These costs and benefits 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).
13. Based on a global GDP of USD 86 trillion in 2019, with 2% annual growth.
14. 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.
15. See De Groot, R.S. et al. 2013. Benefits of investing in ecosystem restoration. Conserv. Biol. 27, 1286–1293 and Verdone, M. and Seidl, A., 2017. Time, space, place, and the Bonn Challenge global forest restoration target. Restoration Ecology, 25: 903-911.

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.

35. 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 Decade's stakeholders to embark on ecosystem restoration using the best available scientific knowledge. For example: 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) will 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) will provide technical guidance on ecosystem restoration relating to SDG 15 Life on Land; the inter-agency mechanism, UN Water, will 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 (MERCES) is well positioned 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 will 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 will work with its members to provide the latest scientific results and research taking place on local ecosystem restoration initiatives across the world; the Global Peatlands Initiative will provide guidelines on how to restore peatlands and prevent their degradation; the Endangered Landscapes Programme will share its experience on landscape restoration in Europe and associated research work; and IUCN's Restoration Opportunities Assessment Methodology (ROAM) can be used for the identification and analysis of ecosystem restoration opportunities at national, subnational and landscape levels. The Decade's stakeholders will also provide spatial data for planning and monitoring ecosystem restoration.

36. With regards to synthesising and disseminating lessons learned from prior experiences in ecosystem restoration, several initiatives are already underway. These include, for example: the Restoration Resource Center Project Database (a compilation of ecosystem restoration projects 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 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 are well positioned 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.

37. The Decade's stakeholders will be asked to focus their efforts in particular on halting, preventing and reversing the negative impacts of food production systems on terrestrial, freshwater and marine ecosystems. Currently, the methods used for producing, transforming, distributing, consuming and disposing of food are causing extreme ecosystem degradation globally, with an average of 30% of all food produced being lost or wasted. The Decade will consequently seek ways to improve food production systems by optimizing resource use, minimizing disturbance of intact ecosystems, reducing food loss and waste, curbing greenhouse gas emissions, avoiding the use of harmful chemicals, and restoring agro-ecological landscapes and seascapes.

d) Management arrangements

Governance structures

38. As the Decade's two lead UN agencies, the main roles of UNEP and FAO will be to: i) empower others to plan, implement and monitor ecosystem restoration; ii) coordinate and promote the Decade; iii) share knowledge, tools and lessons learned, and iv) report on the success of the Decade to the UN General Assembly

as well as donors. Reporting commitments will include *inter alia*: i) informing the Environment Management Group (EMG) of the Decade's progress and plans; ii) establishing an informal coordination mechanism with the secretariats of the three Rio Conventions; iii) reporting regularly on the progress of the UN Decade to Member States through their respective channels; iv) reporting to the Secretary-General for presentation of the Decade's contribution to the implementation of the 2030 Agenda for Sustainable Development at the eighty first session of the UN General Assembly; and v) producing an annual Update Report – focusing on the contribution of ecosystem restoration to the SDGs – for consideration at the High-level Political Forum on Sustainable Development.

39. UNEP and FAO will also implement on-the-ground ecosystem restoration activities – following the work they have done under other projects and programmes such as 'The Restoration Initiative' of the Global Environment Facility. In the Decade, however, the objective is that both agencies will be joined in ecosystem restoration efforts by many other organizations working in all countries and regions. The scale of the global challenge is such that all existing, and many new actors in the field of ecosystem restoration will need to implement the Decade together.

40. 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 Decade's activities and managing all communications. The core team will be able to accept secondments from UN Decade partners, in line with UN rules and regulations. A Decade Coordinator will manage the core team and oversee the work of an Administrative and Finance Officer, an Office Manager and the Heads of Communications & Partnerships, Monitoring, Science & Best Practice and Finance. Coordinators on Partnerships and Volunteers & Youth will work under the Head of Communications & Partnerships. Further support to the 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.

Funding

41. A major focus of the Decade will be to unlock finance in the public and private sectors to upscale restoration. As noted in Section 3b above, in the order of one trillion US dollars is a conservative estimate of the amount of finance required to assist in addressing current environmental crises through ecosystem restoration. The unlocking of such finance will be achieved through *inter alia* changes in government subsidy regimes, taxation regimes and national budgets, as well as through private sector investments. The 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 amongst stakeholders to raise finance. A special Task Force will be established to focus solely on this theme.

42. With regards to activities undertaken by the Decade's core team and core partners, a Multi-Partner Trust Fund, to be housed within the MPTF Administrative Agent of UNDP in New York, will pool and disburse funding. 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 ecosystem restoration projects; connecting investors with potentially bankable ecosystem restoration projects; knowledge management and capacity building; 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 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 $35 trillion in assets under management) are also encouraged to work with the Decade to source financing for major upscaling of ecosystem restoration, including nature-based solutions to climate change. In addition, the Decade will work closely with existing public funds such as the Land Degradation Neutrality Fund, which is co-promoted by the UNCCD and Mirova, 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

43. The goal of the Decade in terms of monitoring and reporting will be to support all global, regional and national commitments under one common global umbrella. By generating and sharing knowledge, and inspiration, the 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 remote sensing and satellite images.

44. Monitoring and reporting of the Decade will be undertaken using existing reporting systems taking place 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 NY 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 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 information gaps. A framework with indicators, reporting lines and timelines is under development.

45. Any new CBD post-2020 framework targets pertaining to ecosystem restoration will be of particular importance for the Decade's monitoring and reporting. Such targets will be adopted and supported by the Decade. It is also envisaged that the 17 Sustainable Development Goals (SDGs) will feature prominently. 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 Decade, extends to 2030. Targets within the SDGs that refer specifically to ecosystem restoration, and which will be linked directly to the 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.

46. A joint evaluation of the 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. The Strategy Group and Decade's core team will be provided with technical guidance from Advisory Boards on a range of themes including: monitoring; communications and knowledge management; science and best practice; and finance. An additional Advisory Board, entitled 'Humans in Nature', comprising a multi-disciplinary team of opinion-makers involved in the implementation of ecosystem restoration, will also be established, if resources allow. This board will be responsible for assisting the global movement in developing an appropriate ethical imperative to restore and care for ecosystems. Strong linkages will be established between the Decade's core team, partner organisations, the Advisory Boards and the Rio Conventions. For example, it is envisaged that the Advisory Board on science and best practice will include representatives and/or Chairs from existing science boards within the Rio Conventions and IPBES.

47. In addition to Advisory Boards, Task Forces will be established, as appropriate, to ensure that cross-cutting themes, such as land tenure, gender, indigenous peoples and youth, are taken into account by the Decade's stakeholders as they implement their activities. The Task Forces will promote dialogues and develop materials on the cross-cutting themes.

Annexes

1. **Barriers**
2. **Indicative activities and sub-activities**

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 and their own well-being[1,2]. 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[3]. The general lack of awareness is partly because ecosystem services such as nutrient cycling, pollination and water provision are not taken into account in market transactions in, for example, the agricultural sector[4].

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 ecosystem restoration are exceptionally high for society at large: ~50% for tropical forests, ~20% for other forests, ~42% for shrublands, and ~79% for grasslands over a 40-year time period[5].

4. *Societal beliefs and behaviours*. Systems of knowledge and the ways in which a society understand its relationship with nature, and/or take it for granted, are deeply embedded in social and cultural norms, traditions, and belief systems. These knowledge systems influence how ecosystems are valued and to what extent their value is incorporated into decision-making at international, national, local and individual levels. This can lead to short-term, local outcomes being prioritised over long-term ones that have local and global benefits. 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. Societal norms and beliefs also need to be taken into account.

5. *Simple and negative messaging*. The inherent complexities of how ecosystems function, how they are degraded, and how they can be restored makes effective communication to a diverse audience challenging. As a result, the messaging is often simplified, with the threats of degradation getting more prominence in the media than the opportunity of ecosystem restoration. This in turn leads to reporting on global environmental concerns being predominantly negative and devoid of the hope that ecosystem restoration can provide.

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1. IPBES (2018): The IPBES assessment report on land degradation and ecosystem restoration. Montanarella, L., Scholes, R., and Brainich, A. (eds.). Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, Bonn, Germany. 744 pages.
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.
3. ELD Initiative (2015). The value of land: Prosperous lands and positive rewards through sustainable land management. Available from www.eld-initiative.org.
4. The Economics of Ecosystems and Biodiversity. 2015. TEEB for Agriculture & Food: Toward 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
5. Ibid

6. *Awareness of the drivers of degradation and their often diffuse nature*. Drivers of degradation in a particular ecosystem are usually both indirect and direct[6,7]. Indirect drivers include societal values and behaviours such as demographic factors (e.g. human population dynamics), socio-cultural factors (e.g. social norms, 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. 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).

7. It is usually difficult to pinpoint a moment in time, at a particular place, 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.

8. *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.

9. *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, and on the scientific principles of how to restore 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.

10. *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. This requires major investments in communication, which are usually not affordable for the organisations involved in producing the messaging. A common approach for organisations working on ecosystem restoration is 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.

11. *The diverse array of ecosystem restoration benefits.* The public is usually poorly informed on the full suite of benefits that arise from investments in large-scale ecosystem restoration partly because the benefits are so

6. IPBES (2018): The IPBES assessment report on land degradation and ecosystem restoration. Montanarella, L., Scholes, R., and Brainich, A. (eds.). Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, Bonn, Germany. 744 pages.
7. 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.

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; for tourism, through improved landscape aesthetics; small businesses, through increased supply of products harvested sustainably from ecosystems; and the health sector, through the reduced prevalence of vector-borne diseases and reduced exposure of the general public to air and water pollutants.

12. *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.

13. *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 siloes 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 to give a full picture of the likely benefits and trade-offs of large-scale ecosystem restoration for society as a whole, including 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.

14. *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.

15. *A scarcity 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 scarcity 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.

16. *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.

17. *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. Although the narrative may not be simple, the business case is often compelling, once the full suite of long-term benefits of ecosystem restoration are fully analysed.

18. *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 infrastructure such as roads, buildings and dams, as opposed to ecological infrastructure which emerges from ecosystem restoration.

19. *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.

Political will

20. 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.

21. *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.

22. *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.

23. *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.

24. *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.

25. *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.

26. *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 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.

Technical Capacity

27. 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 appropriate skills and knowledge. 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.

28. 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 with regards 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.

29. 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. Examples of the types of required technical capacity, which are often missing in large-scale ecosystem restoration initiatives, are listed in table below.

Technical capacity gaps
Policy
Identifying how current government policies (national, local and sectoral) are affecting processes of degradation as well as ecosystem restoration, both nationally and globally.
Reforming and harmonising government policies to catalyse ecosystem restoration, promote cross-sectoral management of ecosystems, including integrating science into policy.
Reforming land tenure systems, including land/ocean use rights, to incentivise local communities to invest in ecosystem restoration activities that will yield short- as well as long-term benefits.
Governance and planning
Developing appropriate governance structures to devolve sufficient power and resources to the local communities if they are undertaking the ecosystem restoration.
Undertaking community-based landscape planning and decision-making.
Facilitating commitments from stakeholders to fund ecosystem restoration and developing mechanisms for the stakeholders to hold one another accountable to the commitments.
Developing equitable cost and benefit sharing models for stakeholders.
Strengthening and/or establishing extension support services and local producer organisations on ecosystem restoration.
Dialogue, communication and partnerships
Developing mechanisms for cross-sectoral cooperation and coordination on ecosystem restoration initiatives among government agencies at local, subnational and national levels.
Communicating the costs, benefits and trade-offs of ecosystem restoration to decision-makers and the general public.
Developing platforms for cross-sectoral negotiations on the trade-offs involved with large-scale ecosystem restoration in an equitable and participatory manner, ultimately leading to consensus among local stakeholders on the mosaic of habitat types and land/ocean uses that are best suited to the local socio-economic and environmental conditions.
Facilitating fine-scale participatory planning (after consensus has been reached on suitable mosaics of habitat types and land/ocean use) through a process of equitable dialogue, on where ecosystem restoration will be undertaken.
Forging and maintaining partnerships and networks amongst the wide range of organisations required in a large-scale ecosystem restoration.
Packaging and disseminating technical information on ecosystem restoration for diverse audiences including inter alia natural-resource policymakers, managers of ecosystem restoration initiatives, and technicians in technical departments across governments, international and regional organisations, bilateral and multilateral development cooperation agencies and NGOs.
Economics and finance
Quantifying the full suite of costs, benefits and trade-offs of large-scale ecosystem restoration.
Strengthening and/or establishing 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.
Structuring funding mechanisms, ranging from seed capital funds to micro-credit, to catalyse ecosystem restoration.
Strengthening 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.
Science, technology and research
Identifying, and addressing, the cross-sectoral factors that caused or are still causing degradation of the ecosystem being restored.
Fully considering and incorporating the voices and aspirations of women, youth, the elderly and indigenous peoples.
Developing ecosystem-specific protocols of ecosystem restoration that detail how local fauna and flora will play a role in the ecosystem restoration process.
Integrating consistent standards of ecosystem restoration across existing ecosystem restoration initiatives.
Engaging with technology companies to develop platforms that will catalyse large-scale ecosystem restoration.
Developing monitoring and evaluation systems (including goals) that are affordable for local stakeholders and able to quantify granular changes in ecosystem structure and function through time as the ecosystem is restored.
Conducting long-term research and development for honing methods and approaches to the ecosystem restoration interventions.

31. 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.

32. The capacity of the enabling environment, organisations and individuals is strongly dependent on the availability of knowledge with regards to designing, implementing and sustaining large-scale ecosystem restoration initiatives. Examples of factors causing knowledge gaps in ecosystem restoration initiatives are outlined in the table below.

Technical knowledge gaps
Policy
Government policies influencing how society uses ecosystems.
Policy and legislative reforms required to incentivise landowners and/or local communities on communal land to embark on large-scale ecosystem restoration.
Governance and planning
Local institutional frameworks that are suitable for implementing long-term research and undertaking frequent adaptive management based on the data collected.
The appropriate governance mechanisms to manage the restored ecosystems for decades ahead.
Dialogue, communication and partnerships
Methods for facilitating and sustaining necessary partnerships between local organisations to undertake large-scale ecosystem restoration.
Methods for generating the long-term political will and funding for regular monitoring as well as maintenance of the restored area.
Economics and finance
Economic incentives influencing how society uses ecosystems.
Economic models quantifying the full suite of expected long-term benefits of ecosystem restoration, including both public and private goods.
Value chains which could be developed to support large-scale ecosystem restoration.
Businesses which could be developed using natural resources sustainably harvested from the restored ecosystems.
The commonly encountered cross-sectoral trade-offs – relating to *inter alia* job creation, income generation, quantity and quality of water generated in catchments, carbon sequestration, agricultural productivity, human health and biodiversity – of restoring the ecosystems versus other methods of using the ecosystems.
Science, technology and research
Scientific details on how to use local fauna and flora to restore ecosystems, including natural regeneration.
Traditional knowledge and practices employed in the past to restore ecosystems.
Linkages between the health of ecosystems and the flow of services to communities in rural as well as urban environments.
The social norms pertaining to the use of ecosystems.
Methods for setting goals, designing interventions, and monitoring/evaluating ecosystem restoration success.

33. *The scientific platform*. The applied science of ecosystem 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.

34. 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.

35. *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 will improve the state of ecosystems, alter income streams for rural livestock farmers, and affect the health of local communities unable to obtain sufficient nutrition through plant-based diets.

36. *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 exposing people to pollution and in many cases a greater density of disease vectors. It is consequently often inconceivable for people to envisage the bountiful, sustainable yields of natural resources and the improvements in public health that are possible through large-scale ecosystem restoration efforts. 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.

37. *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 because the short-term benefits and capital costs of activities that ultimately degrade an ecosystem are invariably 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

UN Decade on Ecosystem Restoration: Indicative activities and sub-activities	Responsible party		
	FAO	UNEP	Other partners
Pathway 1. Global Movement			
Increased knowledge and awareness globally on ecosystem restoration opportunities			

Establish a digital hub to facilitate a global movement on ecosystem restoration.
• Design and operationalise a digital hub to promote interaction, dialogues and exchange of data with the global movement. Indicative sub-activities are listed below.
  ○ Connect existing relevant platforms, with a strong track record of engagement, with users to the hub (e.g. FLRM, GLF, GLFx, InfoFLR, SDG communities of action).
  ○ Identify appropriate methods of information dissemination for different groups and scales.
  ○ 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 *inter alia*: 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.
  ○ Use an adaptive management approach to adjust and hone the design and functionality of the hub as needed.			

Promote the Decade through a wide range of channels. • 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 trade-offs and benefits of ecosystem restoration using online platforms, webinars, communities of practice, TV and radio. • Propose activities focussing on 2-3 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 catalysing and 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 (e.g. grasslands, savannas, and coastal ecosystems); and developing smartphone applications that provide information on ecosystem restoration success and can channel funds/payments to ecosystem restoration practitioners on the ground.			
Societal norms and perceptions shifted with regards to best practices for restoring ecosystems globally			
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. 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 criteria to use for assessing how activities are contributing to a ecosystem restoration goal. • 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. • Collaborate with the International Standards Organization (ISO) to include ecological ecosystem restoration in existing and new standardization processes.			

UN Decade on Ecosystem Restoration: Indicative activities and sub-activities	Responsible party		
	FAO	UNEP	Other partners
• 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. 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 ethical 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 large-scale ecosystem restoration initiatives, identifying and promoting 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 catalysing large-scale ecosystem restoration globally.			
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. 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 ROAM), including costs and benefits, 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 bankable business plans with multi-disciplinary teams. • Develop guidelines on how to prepare business plans and provide examples of model plans focussing 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) how to prepare for investor road shows. • Identify bankable large-scale ecosystem restoration projects, assist ecosystem restoration practitioners prepare bankable business plans and introduce suitable investors to the projects.			
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. • Prepare a wide range of materials (e.g. YouTube clips, media articles, films, radio shows) on ecosystem restoration and results from the task forces (described above) for dissemination. • Publish guidelines developed above in the scientific literature to promote academic debate. • Produce and disseminate books and/or manuals on best practices for ecosystem restoration, including an in-depth analysis of the reasons why large-scale ecosystem restoration initiatives have on occasion failed. • Produce and disseminate books on 'Humans in Nature' and a new ethical imperative on ecosystem restoration.			

UN Decade on Ecosystem Restoration: Indicative activities and sub-activities	Responsible party		
	FAO	UNEP	Other partners
• Facilitate dialogues on ecosystem restoration and adjusting of norms across economic sectors using a wide range of platforms (e.g. webinars, email discussions, conferences, workshops).			
Ecosystem restoration mainstreamed into education systems globally			
Develop content on ecosystem restoration to include in primary, secondary and tertiary 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. 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 and social sciences.			
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.			
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 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.			
Facilitate government and private sector investment in PPPs, value chain development and the implementation of bankable business plans, capitalising on existing initiatives and materials wherever feasible. • 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.			
Pathway 2. Political will			
Policy reforms that promote large-scale ecosystem restoration developed and implemented			
Develop a range of options (which can be tailored for use in different local contexts) for structures of subsidies and tax incentives to promote ecosystem restoration, capitalising on existing initiatives and materials wherever feasible.			
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.			
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			
Initiate dialogues between governments and across sectors on how to innovate and catalyse large-scale ecosystem restoration, capitalising on existing initiatives and materials wherever feasible. • Establish appropriate platforms for the dialogues (e.g. through the 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.			
National ecosystem restoration opportunities championed by Heads of State, Ministers of Finance and Ministers of Planning and Development			

UN Decade on Ecosystem Restoration: Indicative activities and sub-activities	Responsible party		
	FAO	UNEP	Other partners
Initiate dialogues for Heads of State, Ministers of Finance and Ministers of Planning and Development (or equivalent officials), capitalising on existing initiatives and materials wherever feasible. • Establish appropriate platforms for the dialogues (e.g. through the digital hub). • Provide technical material for the dialogues and trainings.			
Pathway 3. Capacity			
Methods for designing, implementing 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. Activities to be facilitated or undertaken by the task force's constituents. 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 and how to prioritise ecosystem restoration activities versus other land use options. • Develop a framework for measuring socio-economic and biophysical improvements achieved through ecosystem restoration. • Develop a set of ecosystem restoration protocols, tools and training mechanisms for specific landscapes and seascapes. These will include the design, implementation and sustainability of the interventions, and will focus on achievement of ecosystem restoration standards and targets. • Develop a set of guidelines for assessing and taking into account the prevailing socioeconomic and biophysical conditions at individual ecosystem restoration sites to ensure *inter alia*: i) gender considerations are appropriately incorporated; ii) environmental and social standards are incorporated; and iii) appropriate incentives are in place for communities to support the long-term maintenance of the restored environment. • Develop 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. • Develop outcome indicators and metrics for ecosystem restoration practitioners. • Advise on how to monitor these indicators, including using remote sensing technology.			
Facilitate the development of technology/improve 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 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.			