UNEP

**Convention on
Biological Diversity**

CONFERENCE OF THE PARTIES TO THE
  CONVENTION ON BIOLOGICAL DIVERSITY
Eleventh meeting
Hyderabad, India, 8-19 October 2012
Item 9 of the provisional agenda*

ECOSYSTEM RESTORATION

Note by the Executive Secretary

I.   INTRODUCTION

1.   Article 8 (f) of the Convention provides that each Party shall, as far as possible, rehabilitate and restore degraded ecosystems and promote the recovery of threatened species, *inter alia*, through the development and implementation of plans or other management strategies. The Strategic Plan for Biodiversity 2011-2020 adopted by the Conference of the Parties to the Convention (COP) on Biological Diversity in decision X/2, includes Aichi Biodiversity Targets that envisage, by 2020, restoring ecosystems that provide essential services (Aichi Target 14) and restoration of at least 15 per cent of degraded ecosystems for enhancing ecosystem resilience for contributing to climate-change mitigation and adaptation and to combating desertification (Aichi Target 15).

2.   While adopting the Multi-Year Programme of Work for the period 2011-2020, in decision X/9 (a) item IX, the Conference of the Parties decided to consider the identification of ways and means to support ecosystem restoration at its eleventh meeting in 2012.

3.   Accordingly, the Subsidiary Body on the Scientific, Technical and Technological Advice (SBSTTA) at its fifteenth meeting held in Montreal in November 2011, considered ecosystem restoration and adopted recommendation XV/2, taking note of the indicative list of available guidance (contained in UNEP/CBD/SBSTTA/16/15/4; paragraph 1 of the recommendation), requesting further work by the Executive Secretary (paragraph 2) and recommending that the Conference of the Parties, in light of its examination of the progress report prepared by the Executive Secretary, considers the need for any further work on ecosystem restoration as well as the possible establishment of an Ad Hoc Technical Expert Group (AHTEG) for this purpose (paragraph 3). The Subsidiary Body also prepared a draft decision for the consideration of the Conference of the Parties (paragraph 4 of the recommendation).

4.   Specifically, in paragraph 2, the Subsidiary Body "request[ed] the Executive Secretary, subject to availability of funding, and in collaboration with relevant international organizations and other partners to initiate work to:

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* UNEP/CBD/COP/11/1.

(a)   Compile the information on practical guidance or guidelines developed by government agencies, non-governmental organizations, private sector, indigenous and local communities, and academic and research institutions for the restoration of specific landscapes, ecosystems, habitats, and their components; and identify gaps, if any, and suggest ways for filling those gaps;

(b)   Consolidate the existing guidance to address the needs of, and prepare materials for different targeted end-users such as policymakers, implementing agencies, and on-the-ground practitioners, including indigenous and local communities;

(c)   Compile information on all relevant tools and technologies, including lessons learned (both positive and negative), and experiences used at different spatial scales and for specific ecosystems and make this information available to support:

(i)   Informed decision-making on ecosystem-restoration policy, legislation, and regulation;

(ii)   Use of best practices for ecosystem restoration among implementing agencies; and

(iii)   The effective design, implementation, and monitoring of ecosystem restoration projects/programmes on the ground;

(d)   Compile information on the application of new and emerging technologies for ecosystem restoration;

(e)   Compile the most used definitions/descriptions of key terms and highlight their links to targets 14 and 15 of the Strategic Plan for Biodiversity 2011-2020 and targets 4 and 8 of the Global Strategy for Plant Conservation; and

(f)   Report on progress in undertaking the above activities for the consideration of the Conference of the Parties at its eleventh meeting.

5.   In response to the request contained in to paragraph 2 (a) to (e) of SBSTTA recommendation XV/2, the Executive Secretary, with the generous funding from the European Union, commissioned the Society for Ecological Restoration, in collaboration with relevant partners and organizations, to collate and compile available information, on ecosystem restoration: (i) guidance and guidelines, (ii) tools and technologies, and (iii) most used definitions. These compilations are presented as information documents UNEP/CBD/COP/11/INF/17, 18 and 19, an overview of which is provided in section II below.

6.   Section II of the present note provides a progress report, in line with paragraph (f) of that recommendation, on activities undertaken in response to SBSTTA recommendation XV/2. It includes an overview of the information compiled. Section III provides further considerations in relation to ecosystem restoration, complementing the information contained in document UNEP/CBD/SBSTTA/15/4. It includes some recent relevant outcomes related to ecosystem restoration including the outcome of Rio+20. The Conference of the Parties may wish to consider this information in conjunction with the draft decision prepared by the Subsidiary Body in paragraph 4 of its recommendation XV/2.

II.   REPORT ON PROGRESS IN UNDERTAKING INTERSESSIONAL ACTIVITIES

7.   The Society for Ecological Restoration (SER) in collaboration with the IUCN World Commission on Protected Areas (WCPA), the IUCN Commission on Ecosystem Management (CEM), the Global Partnership on Forest Landscape Restoration (GPFLR), the Society of Wetland Scientists (SWS), the World Resources Institute (WRI), the Botanic Gardens Conservation International (BGCI) and other related organizations, including the United Nations Convention to Combat Desertification (UNCCD) and the Ramsar Convention on Wetlands, through reaching out to their members/networks, collated and compiled the information contained in these three notes.

8.   The information document on available guidance and guidelines on ecosystem restoration (UNEP/CBD/COP/11/INF/17) addresses paragraph 2 (a) and (b) of SBSTTA recommendation XV/2 and

the information document on available tools and technologies on ecosystem restoration (UNEP/CBD/COP/11/INF/18) addresses paragraph 2 (c) and (d) of SBSTTA recommendation XV/2. The information document on most used definitions/descriptions of key terms related to ecosystem restoration (UNEP/CBD/ COP/11/INF/19) addresses paragraph 2 (e) of SBSTTA recommendation XV/2.

9.   Information document UNEP/CBD/COP/11/INF/18 contains publically available information on ecosystem restoration guidance, tools and technologies which are presented in an annotated bibliography format. Each entry includes the title of the document, a short abstract or summary, an indication of primary targeted end-users, the language(s) in which the document is available, and a full citation with weblink (URL). It is important to note that the abstract or summary does not include an assessment of the document's value or quality and unless otherwise indicated, the document is available only in the language presented. Information document UNEP/CBD/COP/11/INF/19 contains definitions and descriptions of key terms related to ecosystem restoration presented in a glossary format.

10.   As the field of ecological restoration has advanced rapidly in the last decade, the vast majority of the documents and definitions cited in these information notes were published after the year 2000. However, a few older documents and definitions have also been included as they represent seminal contributions that still have relevance today. The hope is that these compilations will provide the foundation for a "living" database to ensure the inclusion of new and valuable resources, and to provide the greatest ease of access for those interested in all aspects of ecosystem restoration.

11.   These compilations are intended to focus, inform and direct decision makers and stakeholders in the public, private and non-government sectors in their efforts to develop and manage ecosystem restoration projects and programmes in a full range of geographic, socio-economic, and political contexts. It is important to bear in mind that ecosystem restoration guidance, tools and technologies can often be quite diverse with regard to their level of specificity, technical depth, ecosystem and degradation context, and targeted end-user, and the resources cited herein should therefore not be taken as blueprints without adapting them to the appropriate, site-specific circumstances.

12.   An overview of the information contained in the three information notes is given below.

Overview of the information document on available guidance/guidelines on ecosystem restoration (UNEP/CBD/COP/11/INF/17):

13.   For the purposes of this information note, 'guidance' and 'guidelines' are defined as instruction, advice or direction that explains the fundamental principles of ecosystem restoration as they relate to specific ecosystems, landscapes, economic sectors, and other related issues. The guidance and guidelines presented here were selected using knowledge-based criteria, recognizing that the unifying principles of ecology and ecosystem management are most effective in guiding the best practice for restoring degraded ecosystems and landscapes, including the establishment of goals, the prioritization of restoration activities and their design and planning, biophysical interventions and manipulations, monitoring and adaptive management, and long-term ecosystem maintenance.

14.   In this information note, every effort has been made to present a representative range of guidance and guidelines that are publically available from a wide variety of organizations and individuals. Section 1 of the note provides a general introduction. Section 2 contains general guidance applicable to all ecosystems and landscapes, while Section 3 contains ecosystem-specific guidance. Section 4 focuses on landscape-scale guidance, and Section 5 provides sector-specific guidance. Annex I contains a preliminary analysis that identifies the current gaps in publically available guidance and guidelines on ecosystem restoration and suggests ways of filling those gaps.

15.   This note annotates 240 available guidance/guidelines out of which 24 are at generic level and 130 address specific ecosystems. Out of these 130 ecosystem specific guidelines, 42 guidelines pertain to Coastal/Marine ecosystems with further break up of eight on mangroves, seven on salt marshes, and six guidelines on coral reefs. Drylands, forests/woodlands, grasslands and savannah ecosystems are addressed by seven, 23 and 14 guidelines respectively. Out of the 23 guidelines on forest/woodland ecosystems, tropical forests are addressed in 11 guidelines and boreal/temperate forests are covered by 12 guidelines.

Inland water ecosystems recorded highest number of available guidelines (44) with the breakup of 24 guidelines on freshwater wetlands followed by 10 guidelines on rivers and six guidelines on peatlands.

16.   Overall, sections 2 and 3 of this information note indicate that there is a significant wealth of guidance that has wide applicability. A preliminary gap analysis points to the need for more guidance and guidelines on the restoration and rehabilitation of dryland and grassland ecosystems, particularly in the tropical and sub-tropical regions of the world.

17.   Section 4 of this note describes 32 guidance or guidelines at landscape level. Out of which seven guidelines address 'forest landscapes', three 'prescribed fire' five 'species re-introductions' and four on 'watersheds. Out of the 13 guidelines available on protected areas, six guidelines address marine protected areas.

18.   Although the object of restoration and rehabilitation is the ecosystem, understanding and accounting for linkages in the landscape is a critical component of the Ecosystem Approach. Information document UNEP/CBD/COP/11/INF/18 on tools and technologies also includes references to a large number of documents that address specific linkages between ecosystems and the broader landscape/seascape where significant advances in coastal zones, watersheds/catchments, river basin, and multi-functional production landscapes are presented.

19.   Section 5 of document UNEP/CBD/COP/11/INF/17 describes 54 sector-specific guidance or guidelines, with the breakup of: Agriculture/Livestock – 6; Biodiversity Offsets – 3; Climate Change -5; Ecosystem Services – 3; Extractive Industries – 10; Fisheries- 3; Indigenous and Local Communities – 11; Recreation/Tourism – 1; Soils/Contaminated Lands- 2; Transport- 4 and Urban Areas – 6. With regard to sector-specific guidance, a preliminary analysis points to some gaps, such as transport, energy, and health. Although ecosystem-specific and landscape-scale guidance is often applicable to these sectors and their activities, public/private agencies and NGOs need to increase their efforts to develop, repackage and make available restoration guidance documents that are directly relevant to key sectors of national and sub-national importance, such as water treatment and sanitation, food and water security, and climate change adaptation.

Overview of the information document on available tools and technologies on ecosystem restoration (UNEP/CBD/ COP/11/INF/18):

20.   For the purposes of this information, 'tools' and 'technologies' are defined as the specific methods, materials, and means used to accomplish ecosystem restoration goals and objectives, or to solve practical problems related to ecosystem restoration. The vast majority of the tools and technologies for ecosystem restoration are found in case-studies and reported experiences which inform decision-making, illustrate best practices, and present lessons learned from on-the-ground projects and programmes. The tools and technologies presented here were selected using knowledge-based criteria, recognizing that the unifying principles of ecology and ecosystem management are most effective in guiding the best practice for restoring degraded ecosystems and landscapes, including the establishment of goals, the prioritization of restoration activities and their design and planning, biophysical interventions and manipulations, monitoring and adaptive management, and long-term ecosystem maintenance.

21.   In this note, every effort has been made to present a representative range of tools and technologies that are publically available from a wide variety of organizations and individuals. Section 1 of this note provides a general introduction. Section 2 contains ecosystem-specific tools and technologies. Section 3 contains landscape-scale tools and technologies. Section 4 contains sector-specific guidance and guidelines. Section 5 contains national plans, strategies and experiences. Section 6 contains documents on future directions for ecosystem restoration. Annex I contains a short note on the application of new and emerging technologies related to ecosystem restoration.

22.   A total of 1,227 publicly available tools / technologies on ecosystem restoration are described in this note out of which 398 ecosystem-specific described in section 2 of the note. 107 tools address Coastal/Marine ecosystems (9 general, 5 country specific, 11 coral reefs, 16 dunes, 8 estuaries, 29 mangroves, 11 salt marshes, 22 seagrasses, 6 shellfish beds). Drylands are addressed in 77 tools (11

general, 26 country specific, 13 livelihoods, 17 Mediterranean-type, 10 soils). Forests/Woodlands ecosystems recorded highest number of available tools /technologies - 156 with the breakup of 9 general, 128 country specific, 12 Mediterranean-type, 1 temperate, and 6 tropical. Grasslands/Savannahs ecosystems are addressed in 40 tools (1 general, 39 country specific). 118 tools address Inland Waters 118 (3 bottomland forests, 10 floodplains, 12 lakes, 22 peatlands, 40 rivers, 31 wetlands).

23.   Section 3 of the note describes 359 tools and technologies at landscape-scale and technologies, of which: General - 20; Adaptive Management - 21; Applied Nucleation – 8; Assisted Natural Regeneration – 15; Coastal Zones – 7; Ecological Engineering -31; Ecosystem Approach – 17; Forest Landscapes – 35; Invasive Species- 46; Monitoring and Evaluation – 44; Prescribed Fire – 25; Protected Areas – 26; Revegetation – 18; Species Re-Introductions – 13; Watersheds – 19; Wilderness – 5; and Wildlife – 9.

24.   Section 4 of the note contains 309 sector-specific tools and technologies, of which: Agriculture/Livestock – 18; Agroforestry – 22; Climate Change- 59 (33 adaptation, 26 mitigation); Ecosystem Services – 40; Extractive Industries – 41; Finance Mechanisms- 35; Fisheries – 7; Indigenous and Local Communities- 40; Recreation/Tourism – 3; Soils/Contaminated Lands – 15; Transport – 4; and Urban Areas – 25.

25.   In section 5 of the note, 49 national plans, strategies and experiences are described. Section 6 provides information on 112 new and emerging themes for ecosystem restoration.

Overview of the information document on most used definitions/descriptions of key terms related to ecosystem restoration (UNEP/CBD/ COP/11/INF/19):

26.   In this note, effort has been made to present a representative range of the most-used definitions, and some helpful descriptions, that are publically available in the peer-reviewed scientific literature and from other relevant published sources. Where more than one definition is given for a term, they are presented in alphabetical order by author or organization. Words or key terms used in the Aichi Biodiversity Targets or GSPC Targets are indicated, e.g. Adaptation (T15) or Ecological Restoration (T14 & 15, GSPC 4 & 8). All definitions and descriptions are verbatim quotations and their references are listed at the end of the document.

27.   This information note contains a glossary of 197 key terms related to ecosystem restoration, most with multiple definitions or descriptions, from 169 distinct sources. For example:

Ecological Restoration (Aichi Targets 14 & 15, GSPC 4 & 8) (*Also Ecosystem Restoration*)

> The process of returning an ecosystem to a natural pre-disturbance structure and function. (Briggs 1996).

> The process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. (SER 2004).

> The process of intentionally altering a site to establish a defined, indigenous ecosystem. The goal of this process is to emulate the structure, function, diversity and dynamics of the specified ecosystem. (UNEP 2003).

> Human intervention … designed to accelerate the recovery of damaged habitats, or to bring ecosystems back to as close an approximation as possible of their pre-disturbance states. (Cairns 1993; Yap 2000).

28.   The compilation presented in these three documents points to a wealth of available information (more than 1500 documents) on guidance, tools and technologies for ecosystem restoration. Although some gaps do exist, recent research, practices and attempts at synthesis are now emerging (e.g., for arctic and alpine ecosystems) and a number of international non-governmental organizations (NGOs) and consortiums are getting under way to develop guidelines, tools and technologies for restoring marine and deep ocean ecosystems as well as mega-diverse tropical forests. There is now an urgent need for providing easy and centralized access to these documents, case studies and other capacity building tools. These resources will be instrumental in assisting communities and countries to more effectively plan and

implement ecosystem restoration actions and, in so doing, to realize the multiple objectives of biodiversity conservation and the recovery and enhancement of ecosystem services for sustainable development, poverty alleviation, combating land degradation and desertification, and climate-change mitigation and adaptation. Open access to these resources will help countries in achieving their global commitments under the Rio conventions and Ramsar, and in particular implementing the Strategic Plan for Biodiversity 2011-2020 and relevant Aichi Targets through effective design and implementation of ecosystem restoration projects and programmes building on lessons learnt. There is an urgent need for a comprehensive and accessible web portal or clearing-house mechanism on ecosystem restoration to provide centralized access to documents, case studies and capacity-building tools.

III.   FURTHER CONSIDERATIONS RELATED TO ECOSYSTEM RESTORATION

Available Information on degraded ecosystems

29.   Ecosystems deliver essential services of immeasurable value.[1] Yet in 2010, nearly two-thirds of the globe's ecosystems are considered degraded[2] to some degree as a result of damage, mismanagement and a failure to invest and reinvest in their productivity, health and sustainability, although exact status of degraded ecosystems worldwide is not available.

30.   The GEF-FAO-UNEP Land Degradation Assessment in Drylands Project, revealed that some 24% of the world's land degradation occurs mainly in Africa south of the Equator, South East Asia, North Central Australia, the Pampas, and the boreal forest in Siberia and North America.[3] More than 20% of this total degrading land falls under croplands; 23% under broadleaved forests, 19% under needle-leaved forests, and 20-25% under rangelands. Under the series of Pilot Analysis of Global Ecosystems (PAGE), World Resource Institute (WRI) reported in 2000 that over five per cent of grasslands are extremely degraded with almost 49 per cent lightly to moderately degraded.[4]

31.   As a contribution to the GPFLR, WRI in partnership with the University of Maryland and the International Union for Conservation of Nature (IUCN)   developed a map on the opportunities for forest and landscape restoration. They reported that about 30 per cent of the global forest cover has been completely lost and a further 20 per cent degraded to some degree. They concluded that more than two billion hectares worldwide offer opportunities for restoration and rehabilitation: with one and half billion hectares best suited for mosaic restoration , in which forests are re-established in multifunctional productive landscapes and up to half a billion hectares with the potential for wide-scale restoration.[5]

32.   In a report published in 2011 on " Reefs at Risk revisited" WRI[6] rated that approximately 75 per cent of the world's coral reefs are threatened (degraded) by local threats such as overfishing, costal development, watershed based pollution and thermal stress. The Food and Agriculture Organization of the United Nations (FAO) has estimated that approximately 50% of mangrove forests have been lost in the last 200 years.

The value of ecosystem restoration

33.   Ecosystems and the biodiversity they harbour underpin economic growth, human development and wellbeing. Natural capital and ecosystem services form the basis of wealth creation. The loss of biodiversity results in serious reductions in the goods (such as food, medicines and building material) and services (such as clean water, oxygen and nutrient cycling) that the Earth's ecosystems provide which in turn make economic prosperity and human survival possible.

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[1] Some have estimated ecosystem services to be worth between $21-72 trillion a year, comparable to the 2008 World Gross National Income of $58 trillion.. Eg: Nellemann, C., E. Corcoran (eds). 2010. Dead Planet, Living Planet – Biodiversity and Ecosystem Restoration for Sustainable Development. A Rapid Response Assessment. United Nations Environment Programme, GRID-Arendal. www.grida.no.

[2] http://ecotope.org/anthromes

[3] http://www.fao.org/nr/lada/ ; see also http://www.isric.org/projects/land-degradation-assessment-drylands-glada

[4] http://pdf.wri.org/page_grasslands.pdf

[5] http://pdf.wri.org/world_of_opportunity_brochure_2011-09.pdf

[6] http://pdf.wri.org/reefs_at_risk_revisited.pdf

34.   There are many examples where efforts to restore degraded ecosystems improved human well-being, supported livelihoods and enhanced ecological resilience. In South Africa, for example, interventions to restore and improve wetlands have not only provided much needed employment opportunities but have also increased the capacity of the wetlands to provide essential services to the poor, including crop and reed production, water for domestic purposes, and grazing for livestock cases (TEEB 2011).[7] Likewise, in the Shinyanga Region in central Tanzania, restoration of the Nihili woodland by utilizing traditional knowledge, yielded   an increase in the provision of ecosystem services from the woodland (e.g. fuel, fruit, building timber, honey, medicines and fodder) and a reduction in the time needed to collect fuel wood and non-timber forest products by several hours. In addition, the sale of tree products has helped pay for children's schooling and allowed more time for education and productive work, thus creating enabling conditions for development (TEEB 2012).[8] It is important to realize that the costs of restoration or rehabilitation can vary widely, with the type of intervention employed, and between different ecosystems and socio-economic contexts. In some cases, the benefits from restoration far exceed the costs with generally high returns as depicted in the Table 1.

Table 1: Estimates of costs and benefits of restoration projects in different ecosystems [9]

Biomes/Ecosystems	Typical cost of restoration (high scenario) US $/ha[10]	Est. ann. benefits from restoration (avg. scenario) US $/ha	Net present value of benefits over 40 years US $/ha	Internal rate of return	Benefit / cost ratio
Coral Reefs	542 000	129 200	1 166 000	7 %	2.8
Coastal	232 700	73 900	935 400	11 %	4.4
Mangroves	2 880	4 290	86 900	40 %	26.4
Inland wetlands	33 000	14 200	171 300	12 %	5.4
Lakes, rivers	4 000	3 800	69 700	27%	15.5
Tropical forests	3 450	7 000	148 700	50 %	37.3
Other forests	2 390	1 620	26 300	20 %	10.3
Woodland, scrubland	990	1 571	32 180	42 %	28.4
Grasslands	260	1 010	22 600	79 %	75.1

Increasing pressure for land

35.   Land-use change remains the biggest driver of biodiversity loss, at least in terrestrial ecosystems. The recent food crisis has thrown into sharp relief the increasingly strong multiple pressures for land for crops and livestock to feed an expanding population, for biofuel production and for infrastructure development as well as for carbon sequestration and biodiversity conservation. With so many demands

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[7] TEEB (2011) The Economics of Ecosystems and Biodiversity in National and International Policy Making. Edited by Patrick ten Brink. Earthscan, London

[8] TEEB (2012b) The Economics of Ecosystems and Biodiversity in Local and Regional Policy and Management. Edited by Heidi Wittmer and Haripriya Gundimeda. Earthscan from Routledge, Abingdon and New York

[9] de Groot, R.S., J. Blignaut, S.van der Ploeg, J. Aronson, T. Elmqvist, and J. Farley. 2012. Investing in Ecosystem Restoration Pays: Evidence from the Field (fothcoming) based on data from Neßhöver, C., J. Aronson, J.N. Blignaut, D. Lehr, A. Vakrou & H. Wittmer 2011. Investing in Ecological Infrastructure. In: *The Economics of Ecosystems and Biodiversity in National and International Policy Making*. edited by Patrick ten Brink. Earthscan, London and Washington. Pp. 401-448.

[10] Typical cost could be lower in low scenario

for land use, leaving land in a degraded state will no longer be a viable option. Thus there is an emerging consensus that restoration of degraded lands and degraded ecosystems is increasingly important. [11]

Recent relevant outcomes related to ecosystem restoration including the outcome of Rio+20

36.   Significant commitments and targets have already been adopted by the three Rio conventions and other conventions and processes that directly establish a policy imperative for ecosystem restoration including:

- The Convention on Biological Diversity (CBD) which has agreed on Aichi Biodiversity Target 15 to restore 15% of degraded ecosystems by 2020;

- The United Nations Framework Convention on Climate Change (UNFCCC) which has adopted a global goal to slow, halt, and reverse forest and carbon loss and enhancing forest carbon stock;

- The United Nations Convention to Combat Desertification (UNCCD) which is in the process of establishing a Land Degradation neutral target by 2030;

- The Ramsar Convention on Wetlands which calls for the full integration of their Principles and guidelines for wetland restoration into National Wetland Policies, and embodies commitments to wise use and to avoiding, mitigating and compensating the negative impacts on the ecological character of wetlands, including through wetland restoration;

- The United Nations Forum on Forests (UNFF) which calls on Member States and others to build on the work of the GPFLR to further develop and implement landscape restoration, which contributes to the four Global Objectives on forests, adopted by the United Nations General Assembly.

37.   In a joint statement issued at Rio+20,[12] the Executive Secretaries of the three Rio conventions committed to tackle sustainable development challenges by focusing on prioritized cross-cutting themes. These include landscape and ecosystem-based approaches to adaptation [e.g., ecosystem restoration], generating and sharing information on climate-change impacts and vulnerability when considering biodiversity and land use and mainstreaming gender into activities related to the implementation of the conventions act. They emphasized the need for "coordinated, concrete, concerted, simple and attainable solutions" to achieve "a truly sustainable future". To this end, they called on countries and Governments to set sustainable development goals, including achievable targets on land, biodiversity and climate change.

38.   In the final outcome document of the United Nations Conference on Sustainable Development, Rio+20, "The Future We Want",[13] prominence is given to ecosystem restoration and its linkages to sustainable development including public works and climate-change response. Here are some of the relevant excerpts:

> **"**We also reaffirm the need to achieve sustainable development by…facilitating ecosystem conservation, regeneration and restoration and resilience in the face of new and emerging challenges" (Para 4).

> "We call for holistic and integrated approaches to sustainable development which will guide humanity to live in harmony with nature and lead to efforts to restore the health and integrity of the Earth's ecosystem" Para 40:

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[11] UNEP(2011) Towards a green Economy-Pathways to sustainable Development and Poverty Eradication, A synthesis for Policy Makers: http://www.unep.org.greeneconomy/Portals/88/documents/GER_synthesis_en.pdf; MA - Millennium Ecosystem Assessment (2005) Ecosystems and Human Well-being: Biodiversity Synthesis. World Resources Institute, Washington, DC.; TEEB (2011) The Economics of Ecosystems and Biodiversity in National and International Policy Making. Edited by Patrick ten Brink. Earthscan, London; Foley, J. A., Ramankutty, N., Brauman, K.A.et al (2011). Solutions for a cultivated planet. *Nature*. **478** (337-342)

[12] http://unfccc.int/files/press/press_releases_advisories/application/pdf/pr_20120621.pdf

[13] http://www.uncsd2012.org/thefuturewewant.html

"We recognize that opportunities for decent work for all and job creation can be availed through, *inter alia*, public and private investments in scientific and technological innovation, public works in restoring, regenerating and conserving natural resources and ecosystems." Para 154:

"We therefore commit to protect, and restore, the health, productivity and resilience of oceans and marine ecosystems." Para 158:

"We call for enhanced efforts to achieve the sustainable management of forests, reforestation, restoration and afforestation, and we support all efforts that effectively slow, halt and reverse deforestation and forest degradation". Para 193:

"We encourage investments, through appropriate incentives and policies, which support the conservation and sustainable use of biological diversity and restoration of degraded ecosystems, consistent and in harmony with the Convention and other relevant international obligations". Para 201:

"We reaffirm our resolve under the United Nations Convention to Combat Desertification (UNCCD) to take coordinated action nationally, regionally and internationally, to monitor, globally, land degradation and restore degraded lands in arid, semi-arid and dry sub humid areas". Para 207:

39.   *The Bonn Challenge* was launched in September 2011 at a ministerial roundtable hosted by Germany, IUCN and the Global Partnership on Forest Landscape Restoration (GPFLR) to restore 150 million hectares of deforested and degraded lands by 2020.[14] At Rio+20, the US Forest Service, Rwanda, a Brazilian Mata Atlantica Forest Restoration Pact, and the Mesoamerican Alliance of Indigenous Peoples have committed to restoring a total of more than 18 million hectares of their forest landscape as an important contribution to the Bonn Challenge.

40.   *The Gaborone Declaration,* in which ten African nations have pledged ahead of Rio+20 to ensure that the contributions of natural capital are quantified and integrated into development and business practice through, *inter alia*: ecosystem restoration measures as well as actions that mitigate stresses on natural capital; knowledge, data, capacity and policy networks to promote leadership and new models in the field of sustainable development, and to increase momentum for positive change.[15]

Enabling factors and collaboration

41.   In order to implement Article 8(f) of the Convention and achieve Aichi Biodiversity Targets 14 and 15 there is a need for a concerted and collaborative effort to support, facilitate, upscale, finance and implement ecosystem restoration activities on the ground. Such activities would not only contribute to the conservation and sustainable use of biodiversity, but also improve food and water security, provide employment and alleviate poverty, promote the conservation and sustainable use of natural capital, combat land degradation and desertification, and mitigate and adapt to climate change. Given the increasing pressure on land, freshwater and marine ecosystems, more ambitious and accelerated efforts are needed for restoring and rehabilitating damaged and degraded ecosystems that offers improved well-being and social equity, while significantly reducing environmental risks and ecological scarcities. This will require active engagement and collaboration between governments, businesses, organizations of, indigenous and local communities and civil society.

42.   The major enabling factors that would assist countries in achieving their ecosystem restoration commitments and targets at all levels include:

- *Political will, leadership and commitment of governments*, at all levels, as indicated by the effective integration of ecosystem restoration policies, programmes and projects across sectors and within their national biodiversity strategies and action plans, plans to mitigate and adapt to

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[14] (http://www.iucn.org/?uNewsID=10172; http://www.ideastransformlandscapes.org/

[5] .http://www.conservation.org/conferences/africa_sustainability_summit/Documents/Gaborone-Declaration-HoS-endorsed_5-30-2012_Govt-of-Botswana_CI_Summit-for-Sustainability-in-Africa.pdf

climate change and combat desertification, national development plans, poverty alleviation strategies, policies, budgets, legislation and regulation.

- Knowledge dissemination and capacity development to transform knowledge and experience into practical applications on the ground. This includes making available guidance, tools and technologies, which contain case studies, lessons learned (both positive and negative), and experiences at different spatial scales and for specific ecosystems that contributes to: (1) informed decision-making, (2) the use of best practices, and (3) the effective design, implementation, and monitoring of ecosystem restoration projects and programmes on the ground.

- Governance, participation and partnerships to facilitate ecosystem restoration decision-making and implementation as well as the equitable distribution of costs and benefits. Governance—who makes decisions, how they are made, and with what information—is at the heart of sustaining and restoring healthy ecosystems. Effective implementation of restoration projects requires not only technical innovation, but more importantly it requires partnerships and the integration of knowledge offered by different stakeholder groups coupled with a clear vision of goals and objectives.

- Financing and other incentive mechanisms required to plan and implement ecosystem restoration projects and programmes as outlined in revised national biodiversity strategies and action plans, plans to mitigate and adapt to climate change and combat desertification, sub-national action plans, strategies and policies. Prior to implementation, many countries will require additional financing for capacity building and technical training workshops on ecosystem restoration. A diverse array of financing options, market and non-market, are available as ecosystem restoration often benefits multiple sectors and can simultaneously address the inter-linked social, economic, and environmental objectives of the biodiversity-related conventions, MEAs and Donor Agencies. Bilateral and multilateral funding agencies, private foundations, the private sector and other donor agencies should also consider aligning their funding programmes with restoration actions identified in the revised NBSAPs and related action plans.

43.   The draft decision prepared by the Subsidiary Body in its paragraphs 4 of its recommendation XV/2 provides ways and means for translating or realizing the above enabling factors.
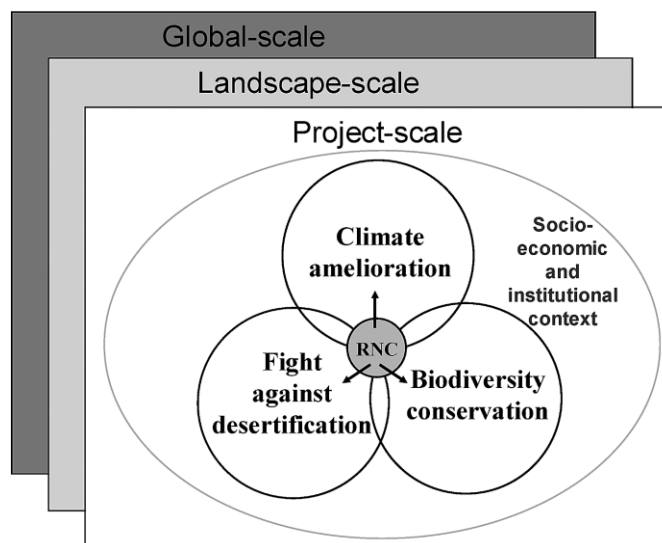

Figure 1. Diagram depicting how Restoring Natural Capital (RNC), or Ecosystem Restoration, can be a cross cutting issue among the three Rio conventions and sustainable development [16]

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[16] Blignaut, Aronson, Mander & Marais, 2008. Ecol. Restoration 26: 143-150

44.   The benefits of effective implementation of restoration projects and programmes not only help to achieve Target 15 and other related Aichi Targets under the Convention on Biological Diversity, but also ecosystem-based adaptation under UNFCC, the proposed land degradation neutral target for drylands under UNCCD, the wise use of wetlands under Ramsar, the four Global Objectives on forests of UNFF, and for achieving Sustainable Development

45.   Relevant institutions - governments, Rio conventions, other Multilateral Environmental Agreements, Donor Agencies, GEF, World Bank, regional development banks, private and corporate donors, business consortia, IUCN, SER, and other relevant international bodies and organizations, organizations of indigenous and local communities and civil society, civil society, should make a concerted and coordinated effort to mobilize long term efforts and resources towards ecosystem restoration and rehabilitation .