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UPDATED ASSESSMENT OF PROGRESS TOWARDS AICHI BIODIVERSITY TARGETS 5 AND 15

Note by the Executive Secretary

INTRODUCTION

1. The Executive Secretary is circulating herewith, for the information of participants at the thirteenth meeting of the Conference of the Parties, an "Updated assessment of progress towards Aichi Biodiversity Targets 5 and 15". A previous version of the document was presented to the Subsidiary Body on Scientific, Technical and Technological Advice at its twentieth meeting (UNEP/CBD/SBSTTA/20/INF/38).

2. The assessment was subsequently updated and drew on input received from workshops held in April and June 2016 as part of the implementation of the Forest Ecosystem Restoration Initiative (FERI).

3. The updated document was also made available for peer review to selected experts from 26 September to 11 October 2016, and incorporates comments received.

4. This updated assessment of progress towards Aichi Biodiversity Targets 5 and 15 is relevant to the work of the Conference of the Parties at its thirteenth meeting in regard to items 9 and 10 of the provisional agenda, as well as items 13 and 19.

* UNEP/CBD/COP/13/1.

UPDATED ASSESSMENT OF PROGRESS TOWARDS AICHI BIODIVERSITY TARGETS 5 AND 15

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EXECUTIVE SUMMARY

The achievement of Aichi Biodiversity Targets 5 and 15[1] is central to the success of the Strategic Plan for Biodiversity 2011-2020. The destruction and degradation of natural habitats, which Target 5 seeks to reduce, represents the single most important driver of biodiversity loss, and with it the loss of critical ecosystem services. Fragmentation is also partly responsible for the destruction and degradation of natural habitats. Incentivizing action and enforcing policy instruments that help to reduce the rate of loss, while enhancing landscape connectivity and biological corridors, as well as promoting regional cooperation for transboundary conservation of biodiversity, are essential elements that complement several global commitments. Preventing further fragmentation of habitats is also essential to avoid species populations from becoming isolated and to enable essential resource flows, resilience and adaptability across landscapes and aquatic environments, especially in light of climate change.

Achieving Target 5 therefore underpins the success of many Aichi Biodiversity Targets, including Target 11 on protected areas, Target 12 on preventing the extinction of threatened species, and Target 14 on enabling the provision of critical ecosystem services and associated global and local benefits for people. Where conversion has already taken place and pressure on the land is decreasing, the reversal of habitat loss, fragmentation and degradation, through ecosystem restoration, an element of Aichi Target 15, represents an immense opportunity for both biodiversity conservation and carbon sequestration objectives.

This report provides an updated assessment of progress towards Targets 5 and 15[2] and an outlook for their advancement by 2020. It draws on several sources, including a review of national biodiversity plans and reports on implementation, global indicators, and an online questionnaire provided to countries ahead of a series of workshops on ecosystem conservation and restoration. The fifth national reports and national biodiversity strategies and action plans (NBSAPs) were reviewed for 22 countries in Latin America, 23 countries in Asia, and 17 countries in West Africa, with the aim of assessing nationally set targets; information gaps; and tools, guidance and other resources offered to countries to advance their commitments by 2020.

Based upon this review, the report underscores further actions needed to fill data gaps, establish baseline information, prioritize efforts and leverage resources. As there is considerable variation among Parties in the amount, level of detail and type of information provided, further related capacity development and training are proposed, involving close collaboration with partner organizations. This could help make existing initiatives in support of the elements of Targets 5 and 15 more accessible and cost-effective in aggregate.

From an operational perspective, the report also illustrates approaches taken by Parties to set national targets, to strengthen methodologies to measure performance with respect to elements of Aichi Biodiversity Targets 5 and 15, and to integrate such information into CBD national reporting processes. Efforts are also being promoted to ensure that the various types of national policies and actions taken adequately support the global biodiversity agenda and can be used to represent a meaningful assessment of progress under Targets 5 and 15. A range of free open access information is also already available, or in development, to help countries improve and verify existing data.

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[1] Aichi Biodiversity Target 5: By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

Aichi Biodiversity Target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.

[2] This report provides an updated assessment since SBSTTA 20, incorporating significant findings from the regional capacity building workshop for Asia held in Bangkok in June 2016, an analysis of actions from countries in West Africa, and inputs received through the peer review process.

Through the Forest Ecosystem Restoration Initiative (FERI),[3] supported by the Korea Forest Service of the Republic of Korea, capacity development workshops have offered country representatives from the biodiversity, business and forestry sectors a platform to present concepts and sustainable and inclusive practices and their results, promote the application of policy instruments and tools that integrate biodiversity standards, engage with diverse stakeholders, and learn how to secure resources. Nationally-specific "country dossiers" were prepared in association with the FERI workshops for the 62 countries reviewed. National agencies in charge of reporting to the CBD are encouraged to use the information contained in their nationally-specific country dossier to identify priority data collection and analysis that could be further specified, as well as linkages to other national development-related commitments.

Key findings of the assessment, based on the following five components of Aichi Biodiversity Targets 5 and 15:

- **Halve the rate of loss of natural forests and reduce it to zero where possible (from Target 5)**

In national reports and NBSAPs reviewed, forest ecosystems appear very prominently, with most countries providing quantitative time series of data of forest cover, often in a spatially explicit manner. Most national targets also make an explicit reference to forest ecosystems, although often without being specific about forest types or what constitutes natural forests. In addition, few of the national targets reviewed were found to be "measurable" and "time-bound", despite the fact that these aspects are reflected in the text of Aichi Biodiversity Target 5.

In addition to national reporting, two sources of data, the Food and Agriculture Organization of the United Nations (FAO) Forest Resources Assessment (FRA) and the Global Forest Change data sets,[4] are available to assess progress under this component. Based on their different methodologies and understanding of the concept of "forest", these sources inform on progress under this component in different ways. However, both sources point to the fact that some progress has been made under this component since 2011, most clearly in Latin America, but that more efforts are needed to reach the quantitative objective of halving the rate of loss of natural forests at the global level. Further support appears particularly needed in Africa where forest loss appears to have accelerated since 2011.

- **Halve the rate of loss of all natural habitats and reduce it to zero where possible (from Target 5)**

Assessing progress against this component of Target 5 is difficult owing to the lack of globally consistent indicators for tracking the extent of ecosystems other than forests. One solution proposed to address this data gap is to use indicators and proxies built after compiling extent time series data drawn from scientific literature and analysed with statistical modelling to determine the underlying trend. The Wetland Extent Trends (WET) Index for Wetlands provides such an example, albeit without direct relevance for an assessment of progress under the Strategic Plan for Biodiversity given the time period considered.

The lack of global indicators is aggravated by the fact that much less information on ecosystems other than forest is included in national reports. In most cases, forests, already prominent in the assessment of past rates of loss and degradation, were the only type of natural ecosystem considered in national targets under Target 5. This could suggest that countries are prioritizing forest ecosystems and improving the values associated to forest biodiversity and to the ecosystems services they provide. However, it also highlights the need for better data to be collected on rates of loss, degradation and fragmentation in ecosystems other than forests, as well as the significant biodiversity and ecosystem services that they provide. In the absence of such data, Parties are understandably unable to set specific, measurable and time-bound targets in ecosystems other than forests.

[3] UNEP/CBD/COP/13/INF/10.

[4] Published by Hansen, Potapov, Moore, Hancher et al. https://earthenginepartners.appspot.com/science-2013-global-forest.

- **Significantly reduce the rate of degradation and fragmentation (from Target 5)**

Measuring the degradation and fragmentation of ecosystems requires tracking, monitoring and assessment tools and indicators, as well as associated data collection, that are specific to the structure, composition and function of the ecosystem under consideration, and can cover many aspects ranging from the richness in species to the provision of ecosystem services to human populations. The diversity of variables that can be considered to assess degradation means that the development of globally consistent indicators that could be readily used at the national scale is especially challenging. This diversity and complexity could also explain the low rates of national reporting and target setting on this component of Target 5, highlighting the crucial need for developing capacity, through tools to help improve human capital, interest and technical skills in this area.

- **Ecosystem resilience has been enhanced, through conservation and restoration, thereby contributing to climate change adaptation and to combating desertification (from Target 15)**

The analysis of national reports and NBSAPs shows that most countries make explicit references to the concept of ecosystem resilience (or to connected concepts such as ecosystem vulnerability). However, these references often lack in specificity and are rarely associated with clear implementation actions for ecosystem-based adaptation and disaster-risk reduction. References to the implementation of the United Nations Convention to Combat Desertification (UNCCD) and its goal of Land Degradation Neutrality, for example, also frequently suffers from the same lack of specificity.

- **The contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation (from Target 15)**

Improving the way ecosystems are managed and used is not only crucial to reduce habitat loss, the main driver of biodiversity decline, it is also a key component in efforts to mitigate climate change. A review of nationally determined contributions (NDCs) under the United Nations Framework Convention on Climate Change (UNFCCC) found several examples of quantitative ecosystem-based mitigation targets (including reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+)) but few examples of how these targets relate to NBSAP implementation. Further information related to the quantitative objectives of NDCs and how they are defined is needed. This could particularly improve policy coherence and generate a better understanding of the value in aligning REDD+ or other ecosystem-based mitigation actions with biodiversity objectives and how these outweigh the costs in the long run. Measures are also needed to maximize benefits and reduce negative impacts (direct or indirect) and externalities between the pursuit of forest and other ecosystem-based mitigation objectives and the pursuit of objectives for the conservation and restoration of natural habitats.

Independently of national targets set under their NBSAPs or NDCs, several Parties to the CBD have pledged actions on forest restoration and reforestation under a number of international initiatives that seek to support climate change mitigation and adaptation, improve water provisions and meet other social and economic development goals. These initiatives represent a great potential to bolster actions towards the achievement of Aichi Biodiversity Targets 5 and 15. However, their exact contribution to the achievement of these targets will depend on how and where actions will be implemented. Moreover, a better appreciation of how such actions contribute to broader sustainable development goals needs to be considered.

I. INTRODUCTION

In decision X/2, the Conference of the Parties (COP) to the Convention on Biological Diversity (CBD), decided to review progress on the implementation of the Strategic Plan for Biodiversity 2011-2020, and requested the Executive Secretary to prepare an analysis of actions established in accordance with the Strategic Plan (para. 17 (b)). This report focuses on an assessment of progress towards Aichi Biodiversity Targets 5 and 15 of the Strategic Plan, addressing other related targets where relevant.

Aichi Biodiversity Target 5's call to action is: "By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced."

Aichi Biodiversity Target 15's call to action is: "By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification."

1.1 Past outlook

The Conference of the Parties, in 2014, at its twelfth meeting, undertook a midterm evaluation of the status of Aichi Biodiversity Targets on the basis of the fourth edition of the Global Biodiversity Outlook (GBO 4).[5] For Aichi Biodiversity Target 5, the evaluation concluded that overall no significant progress has been made. The likely high rate of decline of natural habitats was attributed with medium certainty, due to the scarcity of data for many ecosystem types. The variation in the rates of progress between ecosystems was noted, with rates of forest cover loss significantly slowed in some tropical areas, although with regional variations. Proxy indicators and extrapolations suggested that habitats of all types, including forests, grasslands, wetlands and river systems, continued to be fragmented and degraded.

For Aichi Biodiversity Target 15, the evaluation noted that despite restoration and conservation efforts there was still a net loss of forests, a major global carbon source. Despite many restoration activities under way, an assessment on whether such actions would be sufficient to meet the quantitative target of restoring 15% of degraded ecosystems by 2020 was difficult to conjure. Results from GBO4 indicated that little progress had been achieved on all the components.

The present report provides newly available data, offering an update to the 2014 outlook. It builds on an assessment prepared for the twentieth meeting of the Subsidiary Body on Scientific, Technical and Technological Advice to the CBD (SBSTTA 20) (UNEP/CBD/SBSTTA/20/INF/38), held in late April 2016. It also incorporates findings from a subsequent capacity-building workshop for Asia (Bangkok, June 2016), an analysis of actions from countries in West Africa, and inputs received through the peer review process.

1.2 Importance of Aichi Biodiversity Targets 5 and 15

The outlook delivered by GBO-4 is particularly concerning given that ecosystem conservation and restoration play a central role in the implementation of the Strategic Plan for Biodiversity. The destruction, degradation and fragmentation of natural habitats that Target 5 seeks to reduce represents the single most important driver of biodiversity loss and with it, the loss of ecosystem services that are crucial for human well-being. Preventing further fragmentation of habitats is essential to avoid species populations becoming isolated and to enable essential

[5] Secretariat of the Convention on Biological Diversity (2014). *Global Biodiversity Outlook* 4. Montreal, 155 pages.

movements across landscapes and aquatic environments, especially in the face of environmental change and limited resources.

Fragmentation is also partly responsible for the destruction and degradation of natural habitats, and therefore enhancing connectivity and corridors as well as regional cooperation for transboundary conservation of biodiversity are essential elements that align to Target 11 on protected areas. Achieving Target 5 therefore contributes to the success of many other Aichi Biodiversity Targets, for example on preventing the extinction of threatened species (Target 12). And achievement of other Aichi Biodiversity Targets can substantially contribute to Target 5, for instance effectively managed terrestrial and marine protected areas (Target 11). Where conversion has already taken place and pressure on the land is decreasing, the reversal of habitat loss, degradation and fragmentation, through ecosystem restoration, represents an immense opportunity to generate multiple benefits across the landscape, including biodiversity conservation, carbon sequestration, sustainable livelihoods, improved soil fertility, water quality and quantity, and sustainable productive gains.

By preserving and restoring natural habitats and ecosystems, both Targets 5 and 15 support the provision of critical ecosystem services and associated global and local benefits for people, such as water quality for local consumption, bridging a close link to Aichi Biodiversity Target 14 and Sustainable Development Goal (SDG) 6. Higher levels of diversity have been shown to enhance ecosystem integrity to withstand impacts from natural disasters or pests, making conserved and ecologically restored landscapes and seascapes more likely to adapt to unforeseen impacts.

1.3 Benefits to other Aichi Biodiversity Targets and the Sustainable Development Goals

Actions taken to advance other Aichi Biodiversity Targets can also benefit the achievement of Targets 5 and 15, as noted above. By effectively managing and connecting protected area networks, Target 11 contributes to the reduction of habitat loss and degradation, to flourishing provision of ecosystems goods and services, as well as to facilitating the adaptation and resilience of species and society to changing socioeconomic and climatic conditions. By preventing the loss of threatened species and the irreversible loss of endemic ones, Target 12 further contributes to the ecosystem's health, building its resilience and functions, thereby enhancing the benefits to society.[6]

Further, the sustainable management of areas under agriculture, forestry and aquaculture (Target 7), the reduction of pollution, including from excess nutrients (Target 8), and the control or eradication of priority invasive alien species (Target 9) are all measures that can help reduce the degradation and fragmentation of natural ecosystems.

Addressing underlying drivers of degradation, such as incentives harmful to biodiversity (Target 3) and inappropriate practices, is also crucial to ensure the efficiency of these measures, which should be part of an integrated national biodiversity strategy and action plan (Target 17) that defines clear and achievable national targets in support of Targets 5 and 15. Financial resource mobilization (Target 20) and associated positive incentive measures, like REDD+ and Payments for Ecosystem Services (PES) (Target 3) are also likely to be facilitated by setting clear and measurable objectives which can help foster policy coherence at the national level.

The recently adopted Sustainable Development Goals (SDGs) also emphasize the importance of the conservation and restoration of ecosystems within a global agenda for sustainable development by 2030, in line with elements of Aichi Biodiversity Targets 5 and 15. Over the next fifteen years, the SDGs will provide a framework for countries to *"mobilize efforts to end all forms of poverty, fight inequalities and tackle climate change, while ensuring that no one is left behind."* SDG 15 in particular contemplates the aims of the Strategic Plan for Biodiversity and emphasizes the importance of *"sustainably manag[ing] forests, combat[ing] desertification, … halt[ing] and revers[ing] land*

[6] Brazil has successfully used the creation of protected areas in strategic locations to control the deforestation frontier in the Amazon. From 2002 to 2009, the Brazilian Amazon Protected Area network expanded by 60%; a large part of these new areas were created in regions of intense land conflict to act as green barriers against deforestation. - Soares-Filho B. et al. (2010). Role of Brazilian Amazon protected areas in climate change mitigation. *PNAS* 107, 10821-10826;

degradation and halt[ing] biodiversity loss". Under SDG 15, targets 15.1 to 15.4 provide further detail of how this may be achieved.[7] These targets constitute a renewed expression, by the international community as a whole, of the importance of a variety of ecosystems and their benefits for society. The demonstration of synergies between the 2030 Agenda for Sustainable Development and Aichi Biodiversity Targets 5 and 15 could be a lever for financial resource mobilization, in line with SDG 15, target 15.a, to *"Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems"*.

1.4 Methodology to assess progress and support national action

The updated assessment of progress towards Aichi Biodiversity Targets 5 and 15 and the outlook for their achievement by 2020 provided in this report draws on several sources, including a review of national biodiversity plans for implementation, global indicators and a questionnaire provided to Parties ahead of workshops on ecosystem conservation and restoration. Based on recommendations from the Ad Hoc Technical Expert Group on Indicators for the Strategic Plan for Biodiversity 2011-2020,[8] available indicators were consulted to assess progress against both targets.

The Secretariat, in collaboration with partner organizations, has been carrying out a number of activities aimed at helping strengthen capacities of, and transfer skills to, developing country Parties, in relation to Targets 5 and 15. To identify potential barriers to the implementation of actions to achieve these targets at the national scale, a review of the fifth national reports and NBSAPs[9] was conducted for 22 countries in Latin America and the Caribbean,[10] 23 countries in Asia,[11] and 16 countries in West Africa,[12] focusing on information relevant to Targets 5 and 15.

The aim of that review was to assess and improve the outlook regarding progress in the achievement of Targets 5 and 15, by identifying gaps in relevant national data, plans and strategies, and potential means and modalities to address them. National reports and NBSAPs were screened for a number of elements which relate to data on the state and trends of ecosystems, as well as to gain clarity in the definition of national targets, strategies for their implementation and measures taken to track progress towards their achievement. For the 62 countries reviewed, statistics on the frequency of occurrence of these elements in reporting or target setting have been compiled and are presented under relevant components of the targets. Examples of best practice found in the national reports and NBSAPs reviewed are also presented under each of these elements.

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[7] SDG target 15.1. "By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements"; 15.2. "By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally"; 15.3. "By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world; 15.4. "By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development".

[8] See "Generic and specific indicators for assessing progress in the attainment of the Aichi Biodiversity Targets, including an assessment of their main characteristics", available at https://www.cbd.int/doc/strategic-plan/strategic-plan-indicators-en.pdf.

[9] The text of the Convention requires Parties to submit national biodiversity strategies and action plans (NBSAPs), as well as national reports that describe measures taken to implement the provisions of the Convention and their effectiveness in meeting the objectives of the Convention. Since the adoption of the Strategic Plan for Biodiversity 2011-2020 at CBD COP 10, revised NBSAPs are expected to describe how Parties intend to implement the Strategic Plan and achieve the Aichi Biodiversity Targets at the national level. Accordingly, national reports are expected to contain a number of sections that inform specifically on progress towards achieving the Aichi Biodiversity Targets at the national level.

[10] Argentina, Belize, Plurinational State of Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Uruguay and Venezuela (Bolivarian Republic of).

[11] Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, Democratic People's Republic of Korea, India, Indonesia, Japan, Lao People's Democratic Republic, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Papua New Guinea, Philippines, Republic of Korea, Singapore, Sri Lanka, Thailand, Timor-Leste and Viet Nam.

[12] Benin, Burkina Faso, Cabo Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone and Togo.

This information could help to determine where further support is most needed and explain why it is important for countries to set and report on measurable and achievable targets. It would also help to gather accurate information on the state and trends of natural ecosystems and the direct and underlying drivers of their loss, degradation and fragmentation. The report reveals that further support may be needed to ensure that national targets are supported by effective policy measures, incentives and associated investments to halt further losses, keeping in mind that additional resources will be needed to monitor progress over time and make adjustments as required. Therefore, accounting for the resources needed to implement an NBSAP is critical.

Online questionnaire

The report also draws on information assessed by an online questionnaire[13] sent to representatives of Parties that participated in regional workshops on the restoration of forests and other ecosystems held in Accra, Ghana, 5 to 9 October 2015; Bogota, Colombia, 4 to 8 April 2016 and Bangkok, Thailand, 27 June to 1 July 2016. The questionnaire draws on recommendations from GBO-4 on implementing actions at the national level. It assesses how relevant these actions are in various countries and the potential barriers to their implementation.

Country-specific findings from the review of reports and the questionnaire responses have been compiled in "Country dossiers"[14] for country representatives to refer to in undertaking exercises in FERI capacity-building workshops. These dossiers can also contribute in the identification of gaps in data, and ecosystems requiring immediate action and resources. The resource guidelines for preparing the sixth national reports to the CBD will make note of these country dossiers.

[13] The online questionnaire, structured in four sections (Section 1: Diagnosis of causes and actions to address them (17 questions); Section 2: Linkages to climate change mitigation and adaptation (5 questions); Section 3: Assessment of state and trends of natural ecosystems (15 questions); Section 4: Target setting (9 questions)), was completed by participants from 35 countries. The aim of the questionnaire was primarily to prepare participants to the regional workshops on the type of national information that they should gather in advance of the interactive exercises held during the sessions, and also to inform the agenda of the workshop. In addition, some of the qualitative findings have contributed to this report, and quantitative results will be compiled in 2017 when more responses have been received.

[14] Data dossiers on Aichi Biodiversity Targets 5 and 15 can be consulted here or at https://chm.cbd.int - type "country dossier" and your country name in the search box.

II. ASSESSMENT OF PROGRESS UNDER SPECIFIC COMPONENTS OF AICHI BIODIVERSITY TARGETS 5 AND 15

For the purpose of this assessment, Aichi Biodiversity Targets 5 and 15 were subdivided into the following five components:

- Halve the rate of loss of natural forests and reduce it to zero where possible
- Halve the rate of loss of natural habitats and reduce it to zero where possible
- Significantly reduce the rate of degradation and fragmentation
- Ecosystem resilience has been enhanced, through conservation and restoration, thereby contributing to climate change adaptation and to combating desertification
- The contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation

1.5 Halve the rate of loss of natural forests and reduce it to zero where possible (from Target 5)

Target 5 expressly addresses all natural ecosystems, including forests, when calling for the rate of natural ecosystems loss to be abated by half by 2020, and where possible reduced to zero. In order to assess the rate of loss of natural ecosystems, time series of their extent are needed, generally obtained from remote sensing or field-based sources. The following section presents two data sets, the FAO Forest Resource Assessment 2015 (FAO FRA) and the Global Forest Change data set, which can provide an indication of progress against this target as far as forest ecosystems are concerned.

1.5.1 Indications from the FAO Forest Resource Assessment

Information on forest dynamics, including on the extent of natural forest, has been provided by national governments since 1990, with reports published every five years since 2000, through the FAO FRA. National FRA reports generally come from a combination of ground-based measurement/assessment and remote sensing at the national scale, depending on capacity. An analysis of this data can help inform on how much progress is being made to abate the rate of loss of natural forests at the global scale.

In FRA reports, "natural forest" is defined as the sum of "primary forest", defined as "naturally regenerated forest of native species where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed", and "other naturally regenerated forest", defined as "naturally regenerated forest where there are clearly visible indications of human activities".[15] A shortcoming of this definition is that it encompasses all but actively planted forests, leaving aside areas where assisted natural regeneration is taking place. Under sustainable management practices, forests with assisted natural regeneration may be predominantly "modified natural forests" with significant ecological value and that provide habitat for many species. In Canada and Scandinavia in particular, high figures of net natural forest loss in recent years may be explained by the fact that, in FRA data, assisted natural

[15] Many other criteria have been proposed for what should constitute "natural forest", including how the forest was established (through natural regeneration or planting), the origin of the tree species, the degree of human intervention (also known as "intactness") and ecological functioning. See also Lisen Runsten and Lera Miles, Defining "Natural Forest": Implications for REDD+ Planning (Cambridge: UNEP-WCMC, forthcoming) and Chazdon, R.L., Brancalion, P.H.S., Laestadius, L. et al. When is a forest a forest? Forest concepts and definitions in the era of forest and landscape restoration, *Ambio* (2016) 45: 538.

regeneration is not considered to offset the losses from timber exploitation, despite both being part of an integrated vision for the sustainable productive management of forests in a semi-natural state.[16]

Figure 1 below presents the total area of natural forest for each of the reporting intervals of the FAO FRA since 2000, per continent. The concentration of net natural forest loss in tropical regions appears very clearly, with Africa and South America registering a steady loss over the period while Europe, North America and Oceania remain stable.

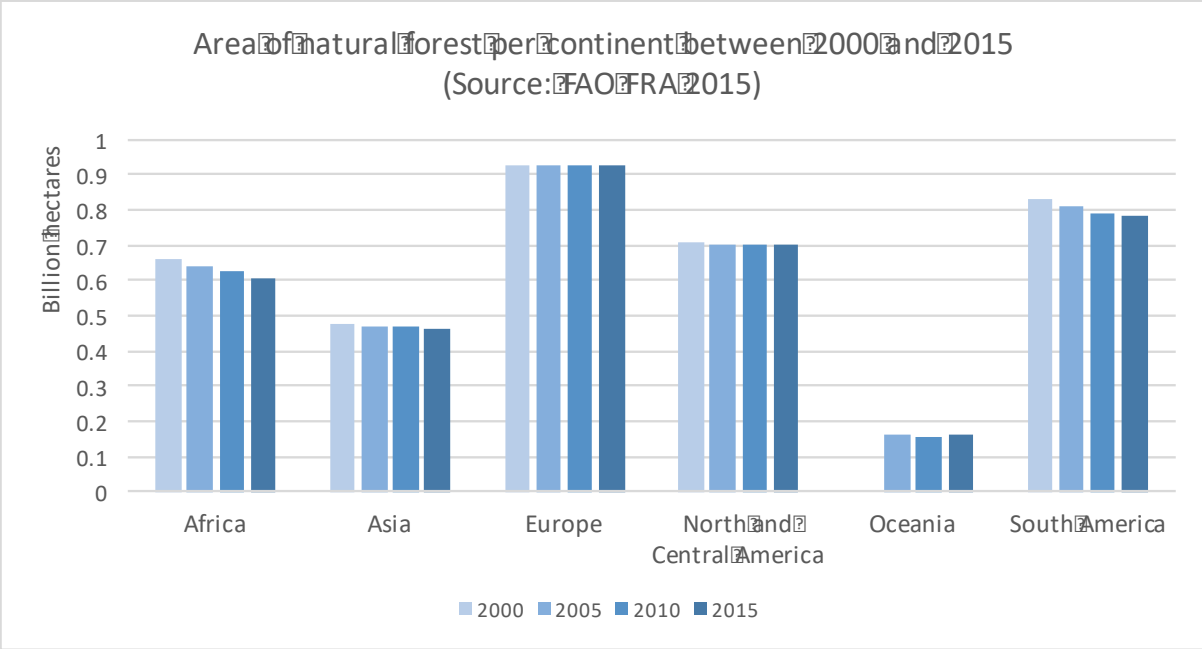

Figure 1 – Area of natural forest per continent between 2000 and 2015 (Source: FAO FRA 2015)[17]

On this graph, the concentration of natural forest loss in tropical regions appears very clearly, with Africa and South America registering a steady loss over the period while Europe, North America and Oceania remain stable. The rate of loss appears to be slowing slightly in the case of South America, reflecting the slowdown of deforestation achieved by Brazil between 2004 and 2014. In Asia, significant losses in Indonesia are partly masked by stated gains in China. However, the area regained through large-scale reforestation may not constitute the same natural habitat as the old-growth forest lost, underlining the shortcoming of looking at forest loss in net terms. Similarly, significant losses at the national scale could be masked by gains in comparatively biodiversity-poor forest regrowth as the data does not disaggregate for gross loss.

Caution should be taken in that using figures of net forest change wrongly implies that forest restoration is the direct inverse of forest loss. While forest loss will in most cases lead to an abrupt loss of carbon stocks, reforestation and restoration may require several decades to return to an equivalent level of carbon stock.

From the standpoint of biodiversity, restoration is also not a perfect remedy to natural habitat loss, as the value of native forests and their interactions within an ecosystem is higher than restored ones, particularly in the short term.[18]

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[16] In Canada and Scandinavia in particular, net natural forest loss in recent years may be explained by the fact that assisted natural regeneration is not offsetting the losses from timber exploitation despite both being part of an integrated vision for the sustainable productive management of forests in a semi-natural state. See also Carle J., Holmgren P. (2003). *Definitions Related to Planted Forests*. FAO Working Paper 79. Forestry Department, Food and Agriculture Organization of the United Nations (FAO). Rome, Italy.

[17] Note: countries for which data was not available for all four reporting periods were omitted from the regional sums. The 2000 reporting period was omitted for Oceania due to the lack of data for Australia. Europe includes the Russian Federation.

[18] Brown S. and Zarin D. (2013). What does zero deforestation mean?, *Science* Vol 342 Issue 15.

Firstly, restored ecosystems may take very long period of times to recover their full ecological functioning.[19] Moreover, no full restoration is possible where habitat loss leads to the extinction of certain species.

In the context of the implementation of the Strategic Plan for Biodiversity, it is therefore important to consider Targets 5 and15 independently in target setting and reporting, and to avoid reporting that would conflate the two (e.g. "net deforestation"). Instead actions should consider reductions in the clearing of native forests (gross deforestation) separately from increases in the establishment of new forests on previously cleared lands (reforestation).

Since the implementation of the Strategic Plan for Biodiversity is at the national scale, a disaggregation of rates of natural forest loss can highlight where national efforts are insufficient to reverse the trend and where more support may be needed. Based on FAO FRA national reports, Figure 2 presents an overview of the global variation in national rates of natural forest loss. Based on the same data, Figure 3 presents the variety of national situations with regard to changes in natural forest area: by looking at changes in the rate of natural forest cover before and after the adoption of the Strategic Plan, several groups of countries can be distinguished.

Figure 3 demonstrates that some countries were already registering net gains in natural forest area prior to the adoption of the Strategic Plan for Biodiversity. Some have seen their rate of gain in natural forest area accelerate, potentially reflecting policy efforts to increase natural forest cover through reforestation and the designation of new protected areas and expansion of existing ones, coupled with efforts to improve management effectiveness and other elements of Target 11. Others have continued to gain in natural forest area, although more slowly than prior to 2010. A possible explanation is the position of these countries at the end of the forest transition curve, with most areas offering obvious potential for forest restoration having already been covered.

Some countries, on the other hand, were registering losses in area of natural forest prior to the adoption of the Strategic Plan. Among these countries, some have seen continued rates of loss over the first half of the implementation period, but at a reduced rate. Successful policies that explicitly seek to address deforestation can explain this change, as in the case of Brazil. Those countries that have managed to reduce their rate of forest loss are showing progress and are potentially on track to achieve the forest component of Target 5, if efforts continue.

Other countries are seeing an acceleration in the rate of loss of their natural forest area since the adoption of the Strategic Plan. These countries will require further attention to make progress towards the achievement of elements of Target 5. The African continent stands out in particular, with most countries in West and Central African tropical moist forest basins experiencing increasing rates of natural forest loss, as well as much of Austral Africa's dry and coastal forests.

South-East Asia appears divided between countries such as Thailand and Viet Nam, where reforestation programmes appear to have reversed the trend of net natural forest loss, and Indonesia, Cambodia and Myanmar where deforestation continues. These contrasting trends observed in neighbouring countries could reflect situations of "leakage" of the drivers of natural forest loss from countries that have strengthened their forest conservation policies and enforcement, to countries where forest governance and enforcement is weaker. This situation can also be observed in South America, where rapidly increasing rates of forest loss in Paraguay, for example, have been linked to a shift of strategy by actors in the Brazilian soy and cattle industry towards land acquisition outside Brazil.[20] Regional economic integration and trade agreements could, in some cases, contribute to these leakage phenomena, thus calling for concerted regional responses to tackle the underlying drivers of demand for agricultural land, wood or other forest products, often outside the forest sector.

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[19] See Parrotta J. et al. (2012). Understanding Relationships between Biodiversity, Carbon, Forests and People: The Key to Achieving REDD+ Objectives. A Global Assessment Report. Prepared by the Global Forest Expert Panel on Biodiversity, Forest Management, and REDD+, IUFRO World Series 31, IUFRO, Austria. Available at http://www.iufro.org/science/gfep/biodiv-forman-redd-panel/report/.

[20] http://www.pnas.org/content/113/15/4021.full.pdf.

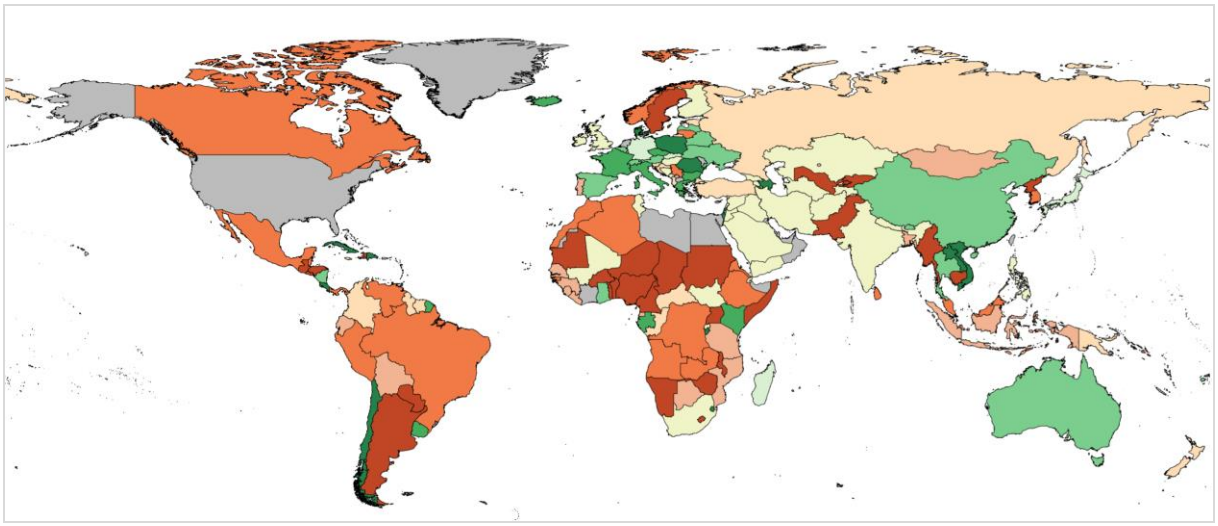


Figure 2 – Average annual rate of change in natural forest area per country between 2010 and 2015 (Original figure based on FAO FRA 2015 data, http://www.fao.org/forest-resources-assessment/en/).

Figure 2 represents the rate of change in natural forest area between 2010 and 2015 as an annual average for every country. This representation gives equal weight to countries regardless of their forest cover, making small losses in absolute terms in low forest cover countries stand out.

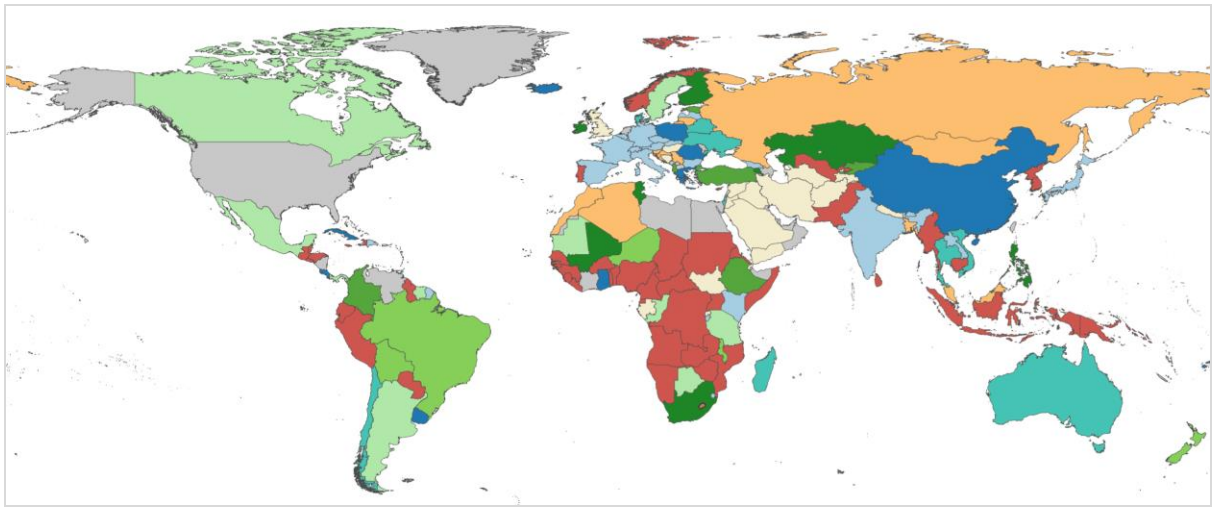


Figure 3 - Change in average annual rate of change in natural forest area between the periods 2005-2010 and 2010-2015 (Original figure based on FAO FRA 2015 data, http://www.fao.org/forest-resources-assessment/en/).

In Figure 3, annual average rate of change in natural forest area is compared for two periods, the 2005-2010 period, which can be taken as the baseline prior to the adoption of the Strategic Plan for Biodiversity, and the 2010-2015 period, which corresponds to the first half of the implementation period of the Plan. A first group of countries, in blue, were already registering gains in natural forest area prior to the adoption of the Strategic Plan. Since the adoption of the Plan, dark blue countries have seen their rate of gain in natural forest area accelerate. Light blue countries have continued to gain in natural forest area, although more slowly than prior to 2010. Countries in green are those where there has been a net loss of natural forest. Countries in red are seeing acceleration in the rate of loss of natural forest area. Countries in red are behind on Target 5 and require international support to follow up their commitments. Caution should be taken in that significant degradation of forests, or the replacement of old-growth forest by early regenerating forest, is not visible from this data.

Legend for Figure 2 – Average annual rate of change in natural forest area per country between 2010 and 2015

- >1% gain
- 0.5-1% gain
- 0.1-0.5% gain
- < 0.1% gain
- No change
- < 0.1% loss
- 0.1-0.5% loss
- 0.5-1% loss
- > 1% loss
- No data or non-Party

Legend for Figure 3 – Change in average annual rate of change in natural forest area between the periods 2005-2010 and 2010-2015

- Increase in rate of natural forest loss
- Went from natural forest area gain to net loss
- No change in natural forest area
- Reduction in rate of natural forest area loss < 25%
- Reduction in rate of natural forest area loss 25-50%
- Reduction in rate of natural forest area loss > 50%
- Reduction in rate of natural forest area loss > 90%
- Went from loss in natural forest area to net gain
- Natural forest gain, slowing,
- Natural forest gain, accelerating
- No data or non-Party

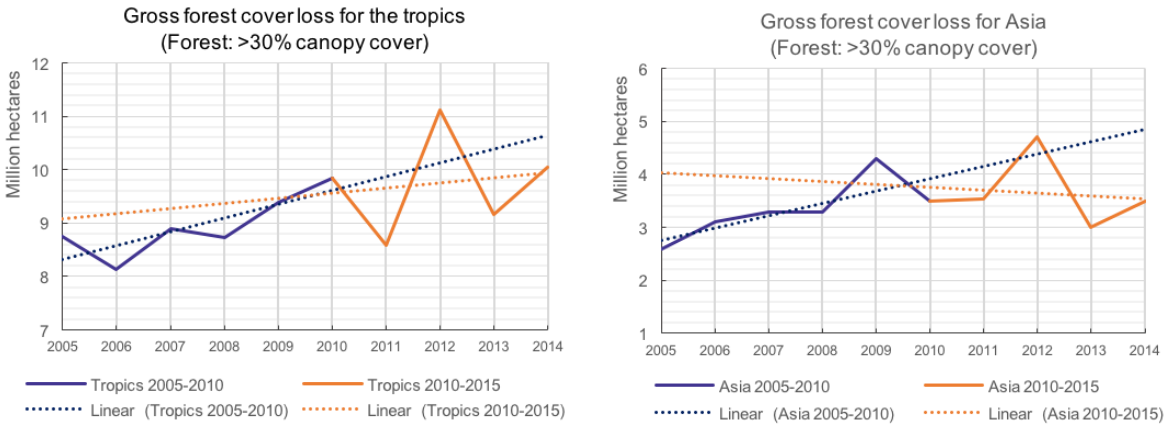
1.5.2 Indications through the Global Forest Change data

Remote sensing observations make it possible to map land cover and land cover changes over large areas or even at global scale, at relatively low costs and regular intervals. The analysis of remote sensing data of forest cover from the Global Forest Change (GCF) data set[21] can be a useful complement to data derived from national inventories and ground-based observations. In line with the findings from the FAO FRA, remote sensing-based data on forest cover confirms that the objective of Target 5 will not be achieved if current rates continue.

Data from the GCF is freely available online through portals like the Global Forest Watch (see Box 1 below) and Parties that do not have access to regularly updated remote sensing data may wish to use it for the purpose of assessing current rates and spatial patterns of forest cover loss.

The graphs in Figure 4 present quantitative forest cover loss data from the GCF map for different regions of the world, focusing on the tropics and developing countries.[22] Trying to calculate a net loss figure would be too uncertain given concerns over the quality of the gain data,[23] therefore only gross loss is presented.

Tree cover loss appears to have been rising steadily since 2005 in the tropics. A slight deceleration of this increase may be discernible since 2010, but such trend remains to be confirmed, in part due to the significant annual variations in the area lost between years. In any case, the objective of halving the rate of loss of natural forests appears difficult to achieve given the rates suggested by the existing data.



[21] The Global Forest Change data set is a high-resolution data set characterizing forest extent and change. Trees are defined as vegetation taller than 5 m in height and are expressed as a percentage of canopy cover for the year 2000, at a resolution of 30 meters. Different thresholds of canopy cover can be used to define forest extent using the data. "Forest Cover Loss" is defined as a stand-replacement disturbance, or the loss of the canopy cover within the forest extent thus defined, is available at yearly intervals between 2001 and 2014. "Forest Cover Gain", the inverse of forest loss, is also available at yearly intervals. – see Hansen, M. (2013). High-resolution global maps of 21st-century forest cover change. *Science* 342, 850–853.

[22] Because the data does not disaggregate between natural and managed forests, gross loss results in temperate and boreal regions are distorted by timber harvest cycles in what may be sustainably managed productive forests.

[23] "Forest regrowth, which the Hansen data set also reports on, is particularly challenging to detect. This is a measurement at the scientific research frontier, and has higher uncertainty and error associated with it, regardless of the data source." – The Nature Conservancy, *Applicability of the Hansen Global Forest Data to REDD+ Policy Decisions*, available at https://www.conservationgateway.org/ConservationPractices/ClimateChange/ForestCarbon/Documents/tnc_REDD+_Hansen.pdf.

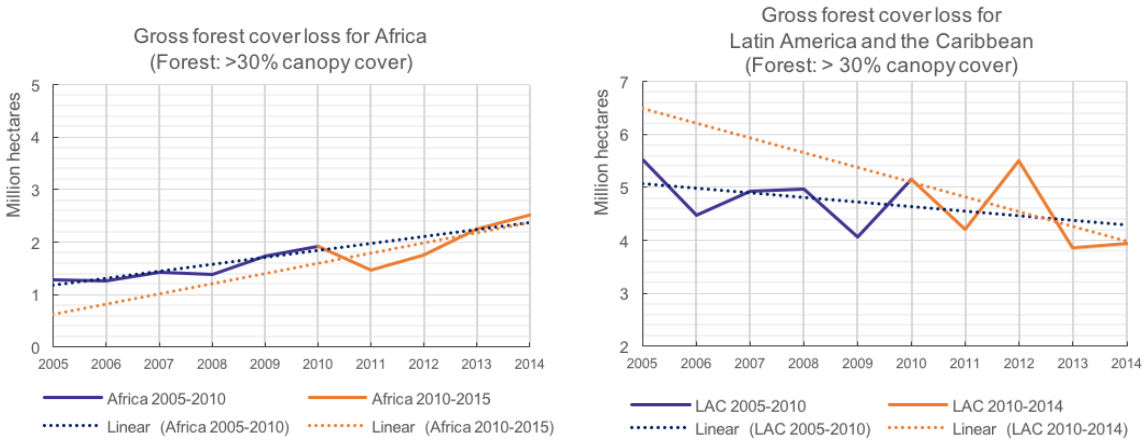


Figure 4 – Gross forest cover loss for different regions. Source: Hansen et al., 2013.

Regionally, the results generally corroborate those from the analysis of FAO FRA data, showing that there might be a slight acceleration in the slowdown of rates of forest cover loss in Latin America since 2010, bringing a 50% reduction of the 2010 rate into sight. In Africa, rates of forest cover loss have increased over the entire period and accelerated since 2010 - the clearest regional trend. The data is inconclusive for Asia, where a reversal of the annual increase in forest cover loss may be happening, but remains very uncertain given the level of volatility between years. These results suggest the need for more coordinated and urgent action to reverse the continued trend of forest loss in tropical countries, which harbour a large fraction of the world's biodiversity.

There are limitations in using this data to measure progress under Target 5. Firstly, due to errors of interpretation in the automatic treatment of Landsat images, the map may be prone to under or over estimations of forest cover by including certain agricultural crops.[24] Tree crops such as cashew, rubber or oil palm will also be counted as tree cover gain despite not providing the same habitat for species as the natural forest cover they may be replacing.

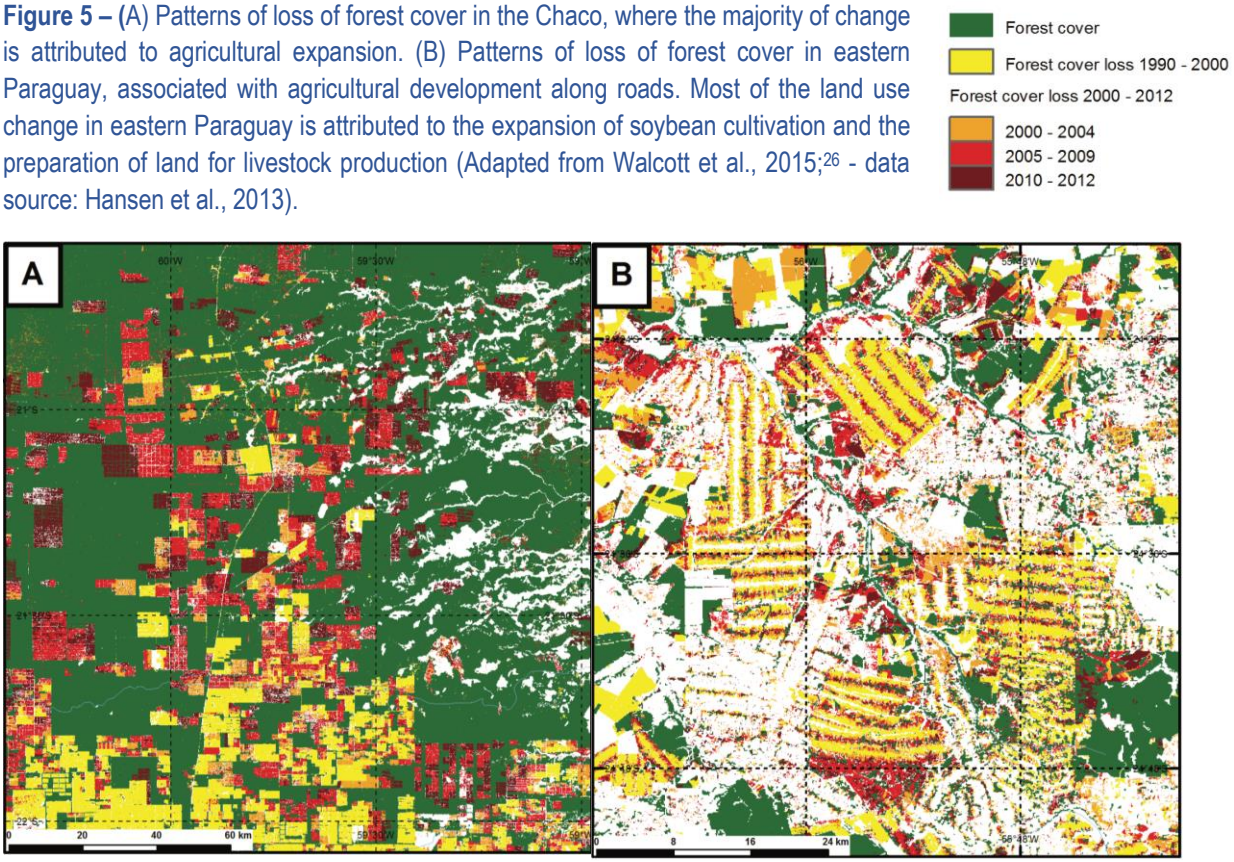
Moreover, the loss of tree cover may occur for many reasons, including deforestation, fire, and logging within the course of sustainable forestry operations. Unlike the FAO FRA, the GFC data set therefore does not represent the phenomenon of deforestation as a transition from one land use to another but rather the mere loss of tree cover, which may not be permanent.[25]

However, the GCF has the benefit of being available at yearly intervals and in a spatially explicit format, which can provide an indication of where and when forest loss is being successfully reduced. The high resolution of the data means that drivers of loss may be identified from the visual observation of patterns of forest cover loss in combination with other contextual information. While loss of tree cover may occur as part of the natural fire regime of an ecosystem, sometimes the geometric patterns that can be observed leave little doubt as to its anthropogenic causes, as illustrated by Figure 5 on forest cover loss in Paraguay.

[24] Tropek et al., (2014). Comment on "High-resolution global maps of 21st-century forest cover change", *Science* Vol. 344, Issue 6187, pp. 981 DOI: 10.1126/science.1248753.

[25] FAO FRA Website, "Comparing results from the Global Forest Resources Assessment and remote sensing" - http://www.fao.org/forest-resources-assessment/en/.

Figure 5 – (A) Patterns of loss of forest cover in the Chaco, where the majority of change is attributed to agricultural expansion. (B) Patterns of loss of forest cover in eastern Paraguay, associated with agricultural development along roads. Most of the land use change in eastern Paraguay is attributed to the expansion of soybean cultivation and the preparation of land for livestock production (Adapted from Walcott et al., 2015;[26] - data source: Hansen et al., 2013).



Box 1. Support Tools - Global Forest Watch

Global Forest Watch (GFW) is an interactive online forest monitoring and alert system which uses a range of remote sensing and other sources of spatial data, including the Global Forest Change annual map of tree cover loss, to provide information about the status of forest landscapes worldwide. Global Forest Watch is free and accessible through a simple web interface (www.globalforestwatch.org) where a number of forest-related spatial data sets can be consulted. Users can also create custom maps, analyze forest trends, subscribe to alerts, or download data for a given area or the entire world. The canopy cover threshold used to characterize forest can easily be modified to fit with national definitions.

A number of biodiversity-related layers can be overlaid on the forest loss and gain data, such as the location of protected areas, biodiversity hotspots, endemic bird areas, alliance for zero extinction sites and tiger conservation landscapes. This information could be used by countries as an indicator of progress under Target 5 and to inform the setting of national targets and actions to implement it.

In addition, a "Climate" section allows users to display biomass and biomass loss values on a map or compile annual statistics at the national and subnational scale which, in combination with other data, could facilitate the monitoring of carbon stocks in natural ecosystems.

[26] Walco, J., J. Thorley, V. Kapos, L. Miles, S. Woroniecki and R. Blaney (2015). *Mapping multiple benefits of REDD+ in Paraguay: using spatial information to support land-use planning.* Cambridge, UK: UNEP-WCMC. Available online at: http://www.un-redd.org/tabid/5954/Default.aspx

1.6 Halve the rate of loss of all natural ecosystems and reduce it to zero where possible (from Target 5)

1.6.1 Outlook based on available global indicators

The review revealed that assessing progress against this component of Target 5 is difficult owing to the lack of globally consistent indicators for tracking the extent of ecosystems other than forests. This paucity of data should be a cause for concern; as efforts to curb the loss of natural ecosystems and to restore degraded ecosystems focus on forests for their benefits in terms of climate mitigation, there is a risk that drivers of land use conversion could be displaced to other ecosystems, including across borders.[27]

In the absence of baseline data on the extent of natural ecosystems other than forests, such a trend would remain undocumented. Afforestation projects could also occur at the detriment of biodiversity-rich ecosystems other than forest, in particular old-growth grasslands.[28] Grassland biomes can sometimes be misrepresented as the result of anthropogenic actions that cleared forest and arrested subsequent succession, and may therefore be the target of efforts to increase forest cover. Efforts are under way to develop criteria for the identification of old-growth grasslands and to distinguish them from recently formed anthropogenic vegetation. This could help to consider the trade-offs between policies and actions to increase forest cover and the benefits of maintaining and conserving grassland ecosystems.[29]

Without time-series data on the extent of ecosystems other than forests, it will be difficult to monitor impacts, and report on progress under Target 5, beyond forest ecosystems. A publication of the FAO from 2005 noted that historical data on grasslands is scarce in most regions of the world, meaning that the degree of change or degradation has to be inferred from present condition.[30] An analysis of FAO statistical data on productive grasslands was conducted in 2008, and concluded that there were increasing rates of loss of such areas in all regions.[31] The trends observed were over the period 1980 to 2000 and do not permit conclusions on rates of loss post 2010.

One solution proposed to address the data gap is to use indicators and proxies built after compiling time series on the extent of these ecosystems in specific locations, drawing on available information from scientific literature and statistical modelling to determine the underlying trend. This methodology already underpins indices such as the Living Planet Index, which tracks trends in populations of various taxonomic groups and is used as an indicator of progress under Aichi Biodiversity Targets 5, 6 and 12.

The Wetlands Extent Trends (WET) index[32] is the first example of such an index for ecosystems, and may be used as a relevant indicator for Target 5. Results from the WET Index show that natural wetlands declined by about 30% on average between 1970 and 2008. Marine and coastal wetlands were affected at a higher rate than inland wetlands. There are significant regional variations in the index, with lost area ranging from 50% in Europe to about 17% in Oceania over the period (see Figure 6 below). The low number of studies found for Latin America means that the index could not be calculated for that region.

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[27] Miles, L. & Kapos, V. (2008). Reducing greenhouse gas emissions from deforestation and forest degradation: global land-use implications. *Science*, 320, 1454–1455.

[28] Veldman J. W. et al. (2015). Tyranny of trees in grassy biomes, *Science* Vol. 347, Issue 6221.

[29] Veldman J. W. et al. (2015). Toward an old-growth concept for grasslands, savannas, and woodlands, *Frontiers in Ecology and the Environment,* Volume 13, Issue 3 Pages 154–162.

[30] Suttie J.M., Reynolds S.G. and Batello C. (Eds.) *(2005).* Grasslands of the World, *Plant Production and Protection Series No. 34,* FAO. Available at http://www.fao.org/docrep/008/y8344e/y8344e00.htm.

[31] http://www.fao.org/ag/agp/agpc/doc/grass_stats/grass-stats.htm.

[32] Dixon M. et al. (2016). Tracking global change in ecosystem area: The Wetland Extent Trends index, *Biological Conservation* 193:27-35.

Conclusions on a change in the rate of loss further to the adoption of the Strategic Plan for Biodiversity is not possible as the WET Index is only available to 2008. This study could, however, be replicated in the future and the database completed with data from further national reporting to the CBD, including on ecosystems other than wetlands. While this may provide a useful indication of regional and global progress towards Target 5 with regard to wetlands, the results cannot be easily disaggregated at the national scale to assess the performance of individual countries at reducing natural wetland loss (although it may be possible where sufficient studies are found for a country).

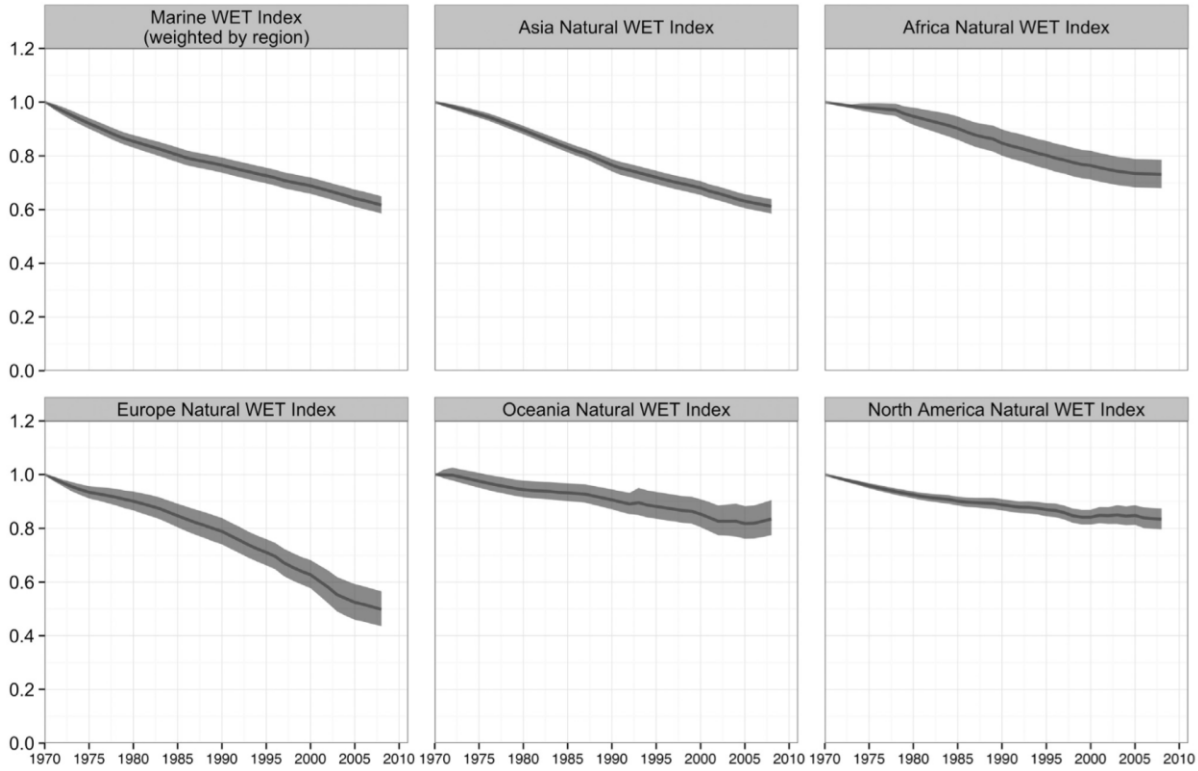

Figure 6 - Marine WET indices and the regional inland natural WET indices (excluding the Neotropics) from 1970 to 2008 with 95% confidence intervals (Source: Dixon et al., 2016)

This section presented a number of data sources that provide an indication of progress under Target 5. An important caveat to the data sources presented is that they are simply measures of change in area and do not reflect change in ecosystem condition. Further indicators and underlying data are crucially needed to better monitor these aspects of Target 5, addressed in Section 1.7.1.

1.6.2 Outlook based on national plans and reporting

The analysis of national reports examined information on the current extent and distribution of natural ecosystems, and on rates and location of natural ecosystem loss, degradation and fragmentation. Results for the 62 countries reviewed showed that forests are the ecosystems that are best covered by quantitative assessments of extent and loss (48 countries, or 77% of the total reviewed), with spatially explicit information included in almost one quarter of reports.

Wetlands were the second most measured type of ecosystem, with 34% of countries including quantitative information on their extent. Quantitative information on any other ecosystems was sparse (found in 34% of reports) and spatially explicit information was scarce (a quarter of reports presented maps of forest ecosystems, and only 10% presented maps of all major natural ecosystems). In total, almost half of the countries presented maps of land cover including natural ecosystems, although sometimes without including a quantitative measure of their extent.

Forest ecosystems were prominent in the reports on rates of natural habitat loss. This may be explained by the historical collection of data on forest cover through international initiatives such as the FAO FRA.[33] More recently, the preparation undertaken by a number of countries to the REDD+ mechanism, as well as the significant financial and technical support received from the UN-REDD Programme and the Forest Carbon Partnership Facility for this purpose may also have improved greatly the availability and quality of information on forests.

The establishment of national forest reference levels, which typically involves the collation and analysis of historical and most recent satellite imagery to deliver accurate data on the forest cover loss and change, and the measurement, reporting and verification (MRV) of emissions from forest requires the set-up of a monitoring system that can produce frequent assessments of changes in forest cover and carbon stocks. Of the 62 countries reviewed, 38 are partners to the UN-REDD Programme, and 33 made a reference in their national reports to the preparations they are undertaking to receive results-based payments for REDD+.

Country examples – assessment of ecosystem loss and degradation

Myanmar's fifth national report presents a particularly clear assessment of ecosystem loss and degradation, specific to forest and mangrove ecosystems. The report presents spatially explicit information on forest cover change between 1990 and 2015 and also demonstrates with overlay maps the change in forest extent from 2010 to 2015. Such quantitative assessments of the state and trends of ecosystems are important in order to set priorities in national actions in support of Aichi Biodiversity Targets 5 and 15. This assessment led the Government of Myanmar, for example, to recognize that recent rates of natural forest loss are of particular concern and that a large-scale forest restoration initiative is needed which builds on and adapts successful case studies to the Myanmar context through greater community participation.[34]

Togo's national report includes maps that present the evolution of land use and land cover using data from the Earth Resources Observation and Science (EROS) Center over periods from 1975 to 2010. This information has helped the Government of Togo to strategize for future restoration and conservation efforts.

As of April 2016, of eight countries in the LAC region receiving support from the UN-REDD Programme, seven had completed their REDD+ National Strategy or Action Plan, seven had set up their national forest monitoring system, and four had submitted a national forest reference level.[35] In the CBD national reports, however, references to the REDD+ strategy and information collected on forest through REDD+ related processes lacked specificity.

Therefore, countries that have completed elements of a REDD+ framework could make better use of that information in preparation for their sixth national reports, and could provide additional details of the alignment of actions under Aichi Biodiversity Targets 5 and 15 in their NBSAPs and their REDD+ National Strategy or Action Plan.

Almost all reports reviewed included a description of drivers of natural habitat loss, and almost half considered the role of underlying drivers as crucial information for the design of measures that can provide results in the long term. Fewer reports, however, looked at how drivers of loss affected different ecosystem types, and none of the reports reviewed contained spatially explicit information on the drivers of ecosystem loss and degradation.

[33] Note should be taken, however, that linkages to reporting under the Forest Resource Assessment are rarely explicit. A detailed review of reporting under both forums would be required to assess whether the information presented is the same.

[34] Myanmar fifth national report to the CBD (2015).

[35] UN-REDD FAO, pers. comm.

Country examples – Analysis of pressures and threats on natural habitats

The national report of **Peru** presented a table of the main threats to natural ecosystems and their importance in different ecosystems (high, medium or low). This type of assessment can be a valuable tool for policy design by helping to prioritize actions on the most threatened ecosystems, while ensuring that pressures are not merely being displaced to other ecosystems under a lower degree of threat.

The national report of **Sri Lanka** presented a table identifying the main threats for major forest types identified through the 2012 national IUCN Red List exercise. This type of assessment can be a valuable tool for policy design by helping to prioritize actions on the most threatened ecosystems, while ensuring that pressures are reduced in the future in order to conserve forest quality, ensure continued ecosystem services and to safeguard habitats for forest fauna.[36]

These various assessments of the state, trends and pressures on natural ecosystems can form the basis of a sound national target to reduce their loss. Of 62 countries reviewed, 36 (58%) were found to have set a national target that clearly aligned with Aichi Biodiversity Target 5. Fewer countries, however, have set a quantitative national target, in line with the element of Target 5 that calls for at least halving and, where possible, bringing close to zero the rate of loss of natural ecosystems. Measuring progress towards achieving a reduction by half of that rate requires a baseline rate, established over a certain period. Based on that baseline, countries should be able to set a target reduction in the rate of loss of ecosystems to contribute towards achieving the global target (which is to reduce this rate by at least half), and a target date for that reduction to be achieved (noting that the period for implementing the Strategic Plan is by 2020).

Since the target is a global one, countries will set their own national targets as a contribution to the global target. Levels of efforts may vary between countries, and national targets may only partially reflect the text of Aichi Biodiversity Target 5. Another possibility is that all aspects of a given target are reflected but that they are spread between several national targets.

Although the Aichi Biodiversity Targets are global, the elements described above should be considered in national target setting, and should be included if the contribution of the national action to achieving the objective of the global target is to be measured. The analyses of national reports and NBSAPs show that of the Parties that have developed a national target in line with Aichi Biodiversity Target 5, not all have specified the target rate of abatement of ecosystem loss to be achieved (23 countries or 37%). Even fewer are those countries that have also specified the target date for that abatement to be achieved (18 countries, or 29% - with target rates of abatement ranging between 10 and 70%) and the reference year or period against which this abatement is measured (4 countries, or 7%). Without these elements, it will be difficult to measure and report on progress at the national level and implementation may not be as strong. Moreover, this lack of specificity makes it impossible to assess progress towards the achievement of Target 5 at the regional or global scale through an aggregation of national targets.

Almost two thirds of countries established priorities among the natural ecosystems present on their territory for the achievement of Target 5. In most cases, forests, already prominent in the assessment of past rates of loss, degradation and fragmentation, were the only type of natural ecosystem considered in the national target. This suggests the value attached to forests, but also the need to fill data gaps to distinguish different forest types and the associated benefits to human well-being and to ensure that better data is collected on rates of loss, degradation and fragmentation in other ecosystems. Data should also be collected on functions, goods and benefits of ecosystem other than forests, which may also harbour significant biodiversity and provide important services.

[36] Sri Lanka fifth national report to the CBD (2014).

Country examples – National target setting under Aichi Biodiversity Target 5

Brazil's national target under Target 5 includes all the elements for a fully measurable target, stating that "By 2020, the rate of loss of native habitats is reduced by at least 50% (in comparison with the 2009 rate) and, as much as possible, brought close to zero, and degradation and fragmentation is significantly reduced in all biomes". In addition, Brazil has also included specific targets for the abatement of rates of loss in different biomes. The experience of Brazil in setting a target for the reduction of emissions from deforestation in the Amazon in relation to results-based payments from Norway, as well as tracking progress under that target and eventually achieving it beyond expectations, may have helped the country measure and set its ambition with such precision in the context of Target 5.[37]

Maldives' national target under Target 5, which aims at a reduction "by half, and where possible to zero" of the rate of loss of natural habitats, provides an interesting example of prioritization: it calls for the prior identification of the rate of loss in all natural habitats and for the targeting of efforts to reduce the rate of loss in habitats where this rate is high.

Gambia's national target under Target 5 aims to reduce the rate of biodiversity loss, forest fragmentation and land degradation by 20% by 2020. Gambia has also accompanied this target with several milestones that are aligned with the overall goal of achieving the national target by 2020.

1.7 Significantly reduce the rate of degradation and fragmentation (from Target 5)

The condition of natural habitats is important for biodiversity. Habitats that are highly degraded or fragmented are less likely to be able to support a diversity of species or to provide the same level of ecosystem services as intact habitats. "Habitat fragmentation is the process by which habitat loss results in the division of large, continuous habitats into smaller, more isolated remnants."[38] A recent analysis of global forest cover revealed that 70% of remaining forest is within one kilometre of the forest's edge, subject to the degrading effects of fragmentation, and that habitat fragmentation reduces biodiversity by 13 to 75% and impairs key ecosystem functions by decreasing biomass and altering nutrient cycles.[39] The conclusion of a major field experiment conducted over 32 years in the Brazilian Amazon supports these findings through a direct record of the many detrimental effects of fragmentation on biodiversity.[40]

While the diminution of extent of habitats is relatively simple to measure, degradation and fragmentation require indicators and associated data collection that are specific to the structure, composition and function of the ecosystem under consideration, and can cover many aspects ranging from the richness in species to the provision of ecosystem services to human populations. The diversity of variables that can be considered to assess degradation means that the development of globally consistent indicators that could be readily used at the national scale across ecosystems is especially challenging and potentially reductive.

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[37] In March 2004, the Brazilian government initiated a range of policies and enforcement actions (under the Action Plan for Preservation and Control of Deforestation in the Legal Amazon) that brought sharp reductions in the rate of deforestation. In 2008, Brazil signed an agreement with Norway to receive payments during a 5-year period for bringing greenhouse gas emissions from deforestation below a 10-year average (1996–2005). Norway pledged up to USD1 billion for this agreement, which stipulated that these funds would be donated to the Amazon Fund (Fundo Amazônia), managed by the Brazilian National Development Bank and invested in actions to prevent deforestation and to promote the conservation and sustainable use of the Amazon biome. For more details see Birdsall N. et al. (2014). *The Brazil-Norway Agreement with Performance-Based Payments for Forest Conservation: Successes, Challenges, and Lessons*, CGD Climate and Forest Paper Series #4, available at http://www.cgdev.org/sites/default/files/brazil-norway-agreement-performance-based-payments-forest-conservation-brief.pdf [accessed 13/03/2016].

[38] Didham, R.K. (Nov 2010). Ecological Consequences of Habitat Fragmentation. In: eLS. John Wiley & Sons Ltd, Chichester. http://www.els.net [doi: 10.1002/9780470015902.a0021904].

[39] Haddad N. M. et al. (2015). Habitat fragmentation and its lasting impact on Earth's ecosystems, *Science Advances,* Vol. 1, no. 2, e1500052 DOI: 10.1126/sciadv.1500052.

[40] See: Laurance, W.F. et al. (2011). The fate of Amazonian forest fragments: A 32-year investigation. *Biol. Conserv*. 144: 56-67.

The need to develop ad hoc indicators for the specific diversity of ecosystems and dimensions of degradation encountered at the national scale explains the low rates of national reporting and target setting on this component of Target 5. While the indicators of degradation themselves will necessarily differ from ecosystem to ecosystem, the principles of how the indicators should be derived could be uniform and globally consistent. One of these principles is that the indicator should relate to the habitat features (biotic or abiotic) that are most important for biodiversity. The feature targeted by the indicator should be important from the perspective of the focal biodiversity in the focal ecosystem type and its monitoring commensurate to financial and/or technical capacity available. Examples of such indicators include the amount of dead wood per unit area in a boreal forest, or the water table level in a peatland ecosystem. National capacity could be further developed in that regard, through capacity-building workshops and direct support at the national level to help improve human capital, interest and technical skills in this area.

1.7.1 Global indicators on ecosystem degradation and fragmentation

Global indicators have been developed under the Group for Earth Observations Biodiversity Observation Network (GEO BON), based on information from a small set of "Essential Biodiversity Variables". These indicators rely on large global data sets, information based on remote sensing, and model-based integration of multiple data sources and types, including ground-based observations, to provide modelled estimates of the impact of observed changes in land cover on species habitats and biodiversity. These indicators can be used at various scales, including national scale. Two of the essential biodiversity variables, the Species Habitat Indices and the Biodiversity Habitat Index, have been identified as having potential for monitoring progress on Target 5, specifically with regard to degradation and fragmentation. Further details can be found in UNEP/CBD/ID/AHTEG/2015/INF/13.

Another indicator, the Global Ecosystem Restoration Index, is still in development but will eventually provide global coverage on information relevant for Target 15 by tracking the state of ecosystems on the restoration-disturbance axis using energy balance, ecosystem productivity and transition in land cover. The online information portal "BON in a Box" (see Box 2) provides access to data from these indicators, which can be disaggregated at the national scale for the purpose of assessing baseline impacts of degradation and fragmentation on biodiversity and monitoring of progress under national targets and actions to reduce them.

The "Intact Forest Landscapes" (IFL) data set, developed by Greenpeace and the World Resources Institute (WRI), also provides a global-scale indicator of fragmentation, although it is limited to certain types of forest ecosystems. IFLs are defined by their size (larger than 500 km^2) and shape (at least 10 km wide at the broadest place and at least 2 km wide in corridors or appendages). Blocks of continuous extent of relatively undisturbed forest ecosystems are particularly important for the conservation of certain species. Fragmentation caused by the expansion of logging, mining and development activities, as well as the infrastructure that comes along with these, opens remote forest areas to further development and "breaks up" these landscapes, leading to an estimated 8% loss in the world's IFLs since 2000.[41]

Box 2. Support Tools – BON in a Box (http://geobon.org/bon-in-a-box/what-is-bon-in-a-box/)

The BON in a Box portal aims to serve as a technology transfer mechanism that allows countries access to the most advanced and effective monitoring protocols, tools and software, thereby lowering the threshold for a country to set up, enhance or harmonize a national biodiversity observing system. BON in a Box will give nations, regions and others a common and scientifically sound set of biodiversity variables, monitoring methods and guidelines, mapping software, and data management, analysis, discovery and reporting tools and platforms, thereby increasing the power at not only a national, but also a regional and global scale, to detect important biodiversity trends and their underlying mechanisms.

[41] See: http://www.wri.org/blog/2014/09/8-percent-worlds-remaining-pristine-forests-degraded-2000.

1.7.2 Outlook based on national plans and reporting

Assessments on the level of ecosystem degradation are less frequent than ecosystem loss in the reports reviewed (See Table 1). This is likely because the former are usually more complex and costly to undertake, due to a lack of monitoring and tracking tools, than the collection of data on natural habitat conversion, which can be obtained from remote-sensing imagery or even, in some cases, through the study of national land registries. An exception is the area of forest ecosystems affected by fires. This information is provided in several national reports, a fact that may be explained by its availability through freely accessible remote-sensing data.

A number of indicators and metrics can be used to measure and report on ecosystem degradation. For most ecosystems, the two dimensions of extent and degree of degradation can be measured. Of the 62 countries reviewed, 26 (42%) presented in their national reports quantitative information related to the extent or degree of forest degradation, only half as much as those who presented information on the extent or rate of forest loss. Information on the extent or degree of degradation of any other ecosystems received less feedback; less than 15 countries or 24%.

Wetlands and waterways were the second ecosystem types, after forests, for which information on degradation was presented. While almost half of the countries mentioned in their national reports or NBSAPs the importance of measuring and addressing fragmentation, especially that of river courses through dam building, no report was found to provide clear indicators of fragmentation to be monitored over time. Defining and quantifying degradation through the use of operational indicators requires establishing baseline values for these indicators. This can be difficult in the absence of historical data on the state of the ecosystems to be monitored. Using the example of biomass carbon as an indicator of forest degradation in Mexico, one approach proposes the use of comparison with a "benchmark value" for these indicators, based on areas of low or no degradation that have comparable biophysical characteristics.[42]

Country examples – Measurement of degradation and fragmentation

The national report of **Chile** presents a particularly clear assessment of ecosystem loss and degradation. It covers a wide range of ecosystems with a regional breakdown of their extent and recent loss, and an estimate of CO_2 emissions resulting from this loss as far as forests are concerned. The report also included information on the degree of degradation of freshwater ecosystems and marine fish stocks. Such quantitative assessments of the state and trends of ecosystems are important in order to set priorities in national actions in support of Aichi Biodiversity Targets 5 and 15. Such assessments can be supported by the use of a variety of indicators on degradation.[43] This assessment led the Government of Chile, for example, to recognize that recent rates of natural forest loss are particularly concerning in the central region of the country and require immediate attention.

[42] Morales-Barquero, L. (2014). Operationalizing the Definition of Forest Degradation for REDD+, with Application to Mexico, *Forests* 5(7), 1653-1681 http://www.mdpi.com/1999-4907/5/7/1653.

[43] The following sources can be consulted for guidance on indicators for forest degradation: Thompson, I.D., M.R. Guariguata, K. Okabe, C. Bahamondez, R. Nasi, V. Heymell, and C. Sabogal. 2013. An operational framework for defining and monitoring forest degradation. *Ecology and Society* 18(2): 20.

Table 1 – Overview of the provision of information relevant to the assessment of state and trends of natural habitats and the setting of national targets under Aichi Biodiversity Target 5, reviewed in national reports and NBSAPs, from 62 countries in Asia, Latin America and the Caribbean, and West Africa

			Asia (# of countries, % of the group)		**LAC** (# of countries, % of the group)		**West Africa** (# of countries, % of the group)	
Assessment of state and trends of ecosystems	**Extent and distribution of natural ecosystems**	Extent of forest	20	83%	13	59%	15	94%
		Map of forest	6	25%	9	41%	1	6%
		Extent of wetlands	10	42%	7	32%	4	25%
		Map of wetlands	5	21%	3	14%	0	0%
		Extent of other ecosystems	5	21%	5	23%	8	50%
		Maps of other ecosystems	2	8%	3	14%	1	6%
		Ecosystem map	9	38%	14	64%	2	13%
	Rate of loss of natural ecosystems	Rate of forest loss	18	75%	18	82%	13	81%
		Map of forest loss	1	4%	7	32%	1	6%
		Rate of wetlands loss	2	8%	4	18%	2	13%
		Map of wetlands loss	0	0%	1	5%	0	0%
		Rate of other ecosystems loss	3	13%	5	23%	3	19%
		Spatially explicit information on ecosystem loss	0	0%	0	0%	1	6%
	Rate of degradation of natural ecosystems	Extent of forest degradation	8	33%	9	41%	8	50%
		Map of forest degradation	5	21%	3	14%	1	6%
		Extent of wetland degradation	1	4%	3	14%	1	6%
		Map of wetland degradation	0	0%	3	14%	0	0%
		Extent of other ecosystem degradation	2	8%	5	23%	3	19%
		Map of other ecosystem degradation	0	0%	4	18%	1	6%
		Indicator of degradation in forest	9	38%	8	36%	9	56%
		Indicator of degradation in wetlands	2	8%	0	0%	0	0%
		Indicator of degradation in other terrestrial ecosystems	1	4%	1	5%	1	6%
		Indicator of degradation in marine ecosystems	0	0%	0	0%	0	0%
Target setting	**Specific, Measureable and Time-bound Target 5**	National target for Aichi Biodiversity Target 5	15	63%	12	55%	9	56%
		Rate of abatement of ecosystem loss	1	4%	3	14%	6	38%
		Target year	13	54%	5	23%	9	56%
		Specification of baseline period	5	21%	4	18%	0	0%
		Prioritization of certain ecosystems	9	38%	6	27%	7	44%

1.8 Ecosystem resilience has been enhanced, through conservation and restoration, thereby contributing to climate change adaptation and to combating desertification (from Target 15)

Ecosystem resilience refers to the ability of an ecosystem to cope with and respond to disturbances and to restore itself. In general, highly resilient ecosystems can respond to natural disturbances, such as fire, flooding and pest outbreaks, more quickly than ecosystems that have low resilience.

With the growing impacts of climate change, ecosystem resilience will become increasingly important as ecosystems will need to cope with changing environmental conditions and more frequent extreme weather events. The degraded state of ecosystems may also cumulate with the effects of climate change and bring natural ecosystems over "tipping points", into a different stable state which may not provide the same services or support the same species.[44]

1.8.1 Ecosystem-based adaptation and disaster risk reduction

Ecosystem-based adaptation (EbA) is the use of biodiversity and ecosystem services as part of an overall strategy to help people adapt to the adverse impacts of climate change. It uses sustainable management, conservation and restoration of ecosystems, and takes into account anticipated climate change impacts, to reduce the vulnerability of communities to these impacts.

EbA can be cost-effective in comparison to the high initial costs of "hard" infrastructural approaches to climate change adaptation, as well as their maintenance costs.[45] It may also complement hard infrastructure approaches, through the development of hybrid approaches that use hard infrastructure to support the development of particular ecosystem functions.[46] In some cases, EbA measures involving the restoration of natural ecosystems can be more cost-effective than hard infrastructure. EbA can provide multiple/additional benefits beyond reducing vulnerability to climate change that support the achievements of other Aichi Biodiversity Targets, such as contributing to the sustainable provision of food and forest products (Target 14), to the conservation of species dependent on the ecosystems thus restored (e.g. by protecting natural breakwaters which are also habitats/spawning grounds for fish) (Targets 6, 10) and to climate change mitigation (through carbon storage and sequestration).

EbA can also be part of a risk management strategy for climate hazards, including disaster risk reduction measures (also referred to as Eco-DRR).[47] Intact, natural ecosystems can play an important role in regulating local climate regimes and reducing risks associated with climate related hazards, such as floods, sea-level rise and cyclones.[48] More details on the benefits of Eco-DRR can be found in UNEP/CBD/SBSTTA 20/10/Add.1.

Ideally, EBA and Eco-DRR measures should be integrated in wider planning at the landscape scale, based on an understanding of ecosystems and the future impacts of climate change, using assessments at an appropriate functional scale (e.g. watershed, river basin, coastal zone, transboundary) which take into account the

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[44] A tipping point is defined in the Global Biodiversity Outlook as a situation in which an ecosystem experiences a shift to a new state, with significant changes to biodiversity and the services to people it underpins, at a regional or global scale. The tipping points are a major concern for decision makers because of their potentially large impacts on biodiversity, ecosystem services, climate change and human well-being. - Secretariat of the Convention on Biological Diversity (2010). Global Biodiversity Outlook 3, accessible at https://www.cbd.int/doc/publications/gbo/gbo3-final-en.pdf.

[45] For example, coral reefs can reduce wave energy by an average of 97%, providing a more cost-effective defence from storm surges than engineered structures - Ferrario, F. et al. (2014). *Nature Commun.* Vol 5, 3794.

[46] For example, in coastal management projects that seek to reduce the impact of rising sea levels, where the construction of structures (e.g. reef modules) on the seabed can support the development of natural reefs.

[47] Source: UNEP coastal ecosystem-based adaptation (EBA) website, accessible at http://web.unep.org/coastal-eba/.

[48] The World Bank (2009). *Convenient Solutions to an Inconvenient Truth: Ecosystem-based Approaches to Climate Change,* accessible at http://go.nature.com/jUnzvL.

interconnectivity of different areas. This can help avoid adaptation activities having unintended negative impacts, including on biodiversity.

One way Parties can prioritize their actions to enhance ecosystem resilience is by preventing the loss and degradation of ecosystems and promoting the benefits of restoration over the costs, in areas where ecosystems are the most vulnerable to climate change. The vulnerability of ecosystems to future potential impacts of climate change was considered in over three quarters of reports, demonstrating that this is an aspect that is already receiving significant attention.

This assessment is, however, limited to general considerations. It does not provide specific information on downscaled climate projections. Climate change impacts on the same ecosystem type are likely to vary in severity depending on the location. The addition of such information could help to further prioritize actions that seek to increase ecosystem resilience to climate change impacts of the most vulnerable ecosystems. Yet, only two countries were found to have included information on the spatial variation of this vulnerability (Belize and Costa Rica).

An increase in the resilience of natural ecosystems would contribute to the continued delivery of services that these ecosystems provide, including in terms of adapting to climate change and combating desertification. Two thirds (66%) of the 62 countries reviewed showed linkages between actions to support the achievement of the Strategic Plan on Biodiversity and adaptation goals, and 45% showed linkages to combating desertification (see Table 2).

Very few reports and national strategies contemplated the management of ecosystems for disaster risk reduction, although many countries in Central America and the Caribbean mentioned natural disasters as a major cause of ecosystem loss and degradation. These results are encouraging, even though the mention of these related objectives often lack specificity. The two following sections provide more information on how the conservation and restoration of ecosystems may contribute to climate change adaptation and combating desertification.

Country examples – Vulnerability, ecosystem-based adaptation and disaster risk reduction

In **Belize,** poverty alleviation programmes now integrate disaster risk management in environmental, social and infrastructure projects to minimize the vulnerability of poor and marginalized persons to natural disasters, with targets that include reducing the rate of biodiversity loss, and improving water quality and water security.

A draft ten-year National Environmental Strategy and five-year Action Plan, developed with funding from the World Bank, will lead to a cross-cutting policy that rationalizes the different environmental policies under different Ministries and Government departments. The Policy will promote, among other themes, “disaster risk reduction and the building of resilient communities”.[49]

[49] Belize’s fifth national report to the Convention on Biological Diversity, Ministry of Forestry, Fisheries and Sustainable Development, 2015.

Table 2. Summary of the evaluation of information provided in NBSAPs and national reports with regard to components of Aichi Biodiversity Target 15 on climate change adaptation and desertification

	Asia (# of countries, % of the group)		LAC (# of countries, % of the group)		West Africa (# of countries, % of the group)	
Consideration of ecosystem resilience	14	58%	11	50%	14	88%
Assessment of climate vulnerability	19	79%	17	77%	10	63%
Map of climate vulnerability	0	0%	2	9%	0	0%
Assessment of contribution of natural ecosystems to adaptation	19	79%	9	41%	12	75%
Assessment of contribution of natural ecosystems to disaster risk reduction	4	17%	0	0%	0	0%
Contribution to combating desertification	8	33%	11	50%	0	63%

1.8.2 Linkages between Aichi Biodiversity Target 15 and the UNCCD goal of Land Degradation Neutrality

At the eleventh meeting of the Conference of the Parties (COP 11) to the UNCCD, in 2013, an intergovernmental working group was created on Land Degradation Neutrality (LDN). After the concept was incorporated into Goal 15 of the SDGs in September 2015, the Parties to the UNCCD, at its COP 12, decided to make the concept a central framework for the implementation of the convention. To achieve LDN, degradation of productive land should be avoided and already degraded lands should be restored. The objective is therefore relevant to both Aichi Biodiversity Targets 5 and 15, as well as to many other Aichi Biodiversity Targets.

Healthy, living soils underpin the functioning of most terrestrial ecosystems. They can serve as habitats for many species and stocks of carbon. In semi-natural ecosystems, anthropogenic activity may have degraded the soils, impacting not only biodiversity, but also the productivity of areas for agriculture. The implementation of climate-smart agriculture and agroforestry policies can help to restore soils as part of a sustainable and resilient vision for water, food and energy security.

The three elements of a monitoring framework for the implementation of the LDN objective – trend in land use/land cover, trend in land productivity and trend in soil carbon stocks – are all relevant for assessing progress on Aichi Biodiversity Targets 5 and 15, and also contribute to implementation of elements under Aichi Target 7. Efforts to collect information under these indicators, at the national scale, could feed into national reports to the CBD and vice versa.

1.9 The contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation (from Target 15)

Degraded ecosystems are not only less resilient to climate change, they also tend to have lower carbon stocks. The degradation of ecosystems in most cases results in the release of carbon, while restoration can help to increase carbon sequestration, depending on the site, and therefore contribute to climate change mitigation. Improving the way ecosystems are managed and used is, therefore, not only crucial to reducing habitat loss, the main driver of biodiversity decline, it is also a key component in efforts to mitigate climate change and adapting to its impacts. More information on this topic can be found in UNEP/CBD/SBSTTA/20/10 on biodiversity and climate change, which reviews and summarizes the current knowledge on the potential contribution of a wide range of ecosystems other than forests, to climate change mitigation. Parties may also wish to consult UNEP/CBD/SBSTTA/20/INF/29, which analyses the relationship between Aichi Biodiversity Targets and land-based climate mitigation.

UNEP/CBD/SBSTTA/20/INF/3 highlights ways in which the management, protection and restoration of ecosystems can contribute to climate change mitigation by reducing emissions from ecosystem degradation and by enhancing carbon sinks. The following summarizes the conclusion of that report: *"According to recent estimates, terrestrial and coastal ecosystems store more than five times as much carbon in plant biomass and soil organic matter as is currently contained in the atmosphere, and land use change and degradation of vegetation and soils are responsible for 10% of the total anthropogenic carbon emissions, including those from fossil fuel combustion. At the same time, terrestrial ecosystems not affected by land use change remove a net amount of around 2.55 gigatonnes of carbon (Gt C) per year from the atmosphere. While in the past the terrestrial carbon sink has mostly been attributed to forests, a recent analysis of remote sensing data suggests that other ecosystems, in particular dryland systems such as tropical savannahs and shrublands, also make a significant contribution".*

The role that the conservation and restoration of functional ecosystems may play in this regard has long been the object of negotiations under the UNFCCC. National plans and commitments to mitigate climate change are therefore highly relevant to the implementation of this component of Target 15. The role of ecosystems in climate mitigation is considered in the UNFCCC as the Land Use, Land Use Change and Forestry (LULUCF) sector. Forests in developing countries are under particular pressure from conversion and responsible for a large share of LULUCF emissions. Forests have also been the centre of attention in the UNFCCC negotiations since 2003.

Article 5 of the Paris Agreement, building on a series of decisions from the UNFCCC COP,[50] sets up a mechanism whereby developing countries may receive payments for the results they have achieved to reduce emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of carbon stocks in developing countries (REDD+). A number of the LULUCF intended mitigation contributions thus fall under the scope of REDD+, with many countries, especially developing ones, emphasizing the importance of a reduction of the loss of forest ecosystems and of forest restoration, and several noting that these contributions are conditional on further international financial support to enable forest-related mitigation.

Prior to UNFCCC COP 21, Parties were asked to prepare and submit nationally determined contributions[51] (NDCs), outlining post-2020 actions they intend to take under a new international agreement. NDCs present the actions that Parties are proposing to undertake to mitigate emissions under a variety of sectors. The importance of ecosystem-based climate change mitigation is reflected in the content of the NDCs, which include contributions with regard to emissions from the conversion and degradation of forests under both LULUCF and REDD+.

NDCs from the same 62 countries were reviewed for LULUCF and REDD+ objectives. Eleven were found to have quantitative targets under LULUCF or REDD+ (see Table 3). Two countries made an explicit reference to the link between these targets and their NBSAPs. Guatemala's NDC, for example, notes that *"Among the relevant actions is the implementation of the National Biodiversity Strategy and Action Plan 2012 - 2022, which allows for the integration of biodiversity in adaptation and mitigation to climate change and for the appreciation of ancestral knowledge of indigenous peoples, recognizing the cultural relevance of rural and indigenous economic models in adapting to climate change".*

[50] Notably UNFCCC Decision 1/CP.16, UN Doc. FCCC/CP/2010/7/Add.1, as well as UNFCCC decisions 9/CP.19, 10/CP.19, 11/CP.19, 12/CP.19, 13/CP.19, 14/CP.19 and 15/CP.19.

[51] All INDCs submitted by parties can be consulted at http://unfccc.int/focus/indc_portal/items/8766.php.

Table 3. Summary of information provided with regard to the assessment of carbon stocks and density in natural habitats and the setting of national targets under Aichi Biodiversity Target 15

		ASIA		LAC		West Africa	
		# of countries	% in the region	# of countries	% in the region	# of countries	% in the region
Assessment of carbon stocks and density in natural ecosystems	Quantitative assessment of carbon stock or density in forests	3	13%	2	9%	3	19%
	Quantitative assessment of carbon stock or density in peatlands	1	4%	1	5%	0	0%
	Quantitative assessment of carbon stock or density in other ecosystems	1	4%	0	0%	1	6%
	Map of carbon density in ecosystems	1	4%	1	5%	0	0%
Specific, Measurable Aichi Target 15	National target for Aichi Biodiversity Target 15	14	58%	12	55%	10	63%
	Conservation actions explicitly aimed at preserving biomass carbon in natural ecosystems	13	54%	9	41%	11	69%
	Quantitative target for the conservation of carbon in natural ecosystem	0	0%	0	0%	0	0%
	Restoration actions explicitly aimed at enhancing biomass carbon in natural ecosystems	12	50%	9	41%	13	81%
	Quantitative target for the enhancement of carbon in natural ecosystem	0	0%	9	41%	12	75%
	Quantitative target area for restoration	9	38%	9	41%	9	56%
	Quantitative target area for restoration includes breakdown by ecosystem	0	0%	1	5%	0	0%
	Map of area targeted for restoration	0	0%	0	0%	0	0%

Myanmar's NDC also makes reference to its NBSAP as a specific element under its contribution in the forest sector: *"In 2011, the National Biodiversity Strategy and Action Plan was published as a complementary strategy to the [30-Year National Forestry] Master Plan, and it was here that the level of ambition of increasing Protected Area Systems to 10% of national land cover was made".*

In addition, without making an explicit reference to its NBSAP (the updated version of which is still to be adopted), Mexico mentions how its mitigation and adaptation contributions could support many elements of the Strategic Plan for Biodiversity, including ecological connectivity of protected areas, coastal protection and the protection of marine ecosystems, as well as the integral management of water and the protection of species from the negative impacts of climate change. Two of the countries reviewed (Nepal, Laos), have made an explicit reference to their REDD+ objectives in their NBSAP.

The annex below presents, for the 62 countries reviewed, those for which quantitative area-based or volume-based NDCs in the Agriculture, Forestry and Other Land Use (AFOLU) or LULUCF sectors under UNFCCC were found, and compares these NDCs to the national targets expressed in their communications to the CBD. The majority of these countries have yet to adopt a revised NBSAP with updated national targets that explicitly contemplate Aichi Biodiversity Targets 5 and 15. For most Parties that already count with such targets, or draft targets where the NBSAP is yet to be adopted, there appears to be no consistency or cross-referencing between the ecosystem-based quantitative contributions under the UNFCCC and the national targets under Aichi Biodiversity Targets 5 and 15. This

report therefore suggest that Parties consider how these different targets are articulate, especially where they are expressed in quantitative terms. (See annex for detailed recommendations, illustrated with country examples.)

Clarification of how climate mitigation targets and ecosystem conservation and restoration targets are articulated is particularly important because intended mitigation contributions through LULUCF or REDD+ are highly relevant to Aichi Biodiversity Targets 5 and 15.

While not all REDD+ actions or actions in the LULUCF sector are aligned with biodiversity objectives, measures could be taken to maximize synergies and reduce potential negative impacts (direct and indirect) and externalities between forest and other ecosystem-based mitigation, as well as with actions on the conservation and restoration of natural habitats. Among the five activities encompassed by REDD+,[52] the reduction of deforestation and forest degradation, as well as the conservation of carbon stocks, in natural forests, presents obvious linkages with Aichi Biodiversity Targets 5. The enhancement of carbon stocks, on the other hand, could contribute to aspects on the restoration of degraded ecosystems in Aichi Biodiversity Target 15. Depending on the specific actions implemented in support of these activities, as well as their location, REDD+ national strategies may also support a number of other Aichi Biodiversity Targets. Support tools to explore these relationships at the national or regional scale, developed as part of the REDD-PAC project and UN-REDD, are presented in Boxes 3 and 4 below.

The linkages at the national scale between REDD+ and NBSAPs are also further described in UNEP/CBD/COP/12/INF/15.[53] The potential for REDD+ to contribute to progress under the Strategic Plan for Biodiversity 2011-2020 and the ways to measure this contribution are discussed in UNEP/CBD/SBSTTA/20/INF/30,[54] which also highlights the role that information generated by national efforts to implement REDD+ could play in monitoring progress under a number of Aichi Biodiversity Targets, including Aichi Targets 5 and 15.

Despite the intention of many of the countries reviewed to take part in the REDD+ mechanism, few have included in their reports an assessment of the carbon stocks contained in natural ecosystems, or of the average density in biomass carbon of these ecosystems (9 countries or 15%), and even fewer in a spatially-explicit manner (2 countries or 3%). This is in contrast with the relatively high number of countries that highlighted the role of conservation measures to preserve biomass carbon in ecosystems (33 countries or 53%) and the role of restoration measures to enhance biomass carbon in ecosystems (34 countries or 55%). Technical support received under REDD+ can help countries assess and monitor carbon-related variables. These assessments could be used to report on how the contribution of biodiversity to carbon stocks has been enhanced. In the absence of national-scale data on biomass carbon, Parties may wish to consult readily available data portals such as the Global Forest Watch - Climate (see Box 1).

Moreover, the implementation of the intended contributions of developing countries may receive financial support from the Green Climate Fund and other financial mechanisms, be it with regard to the role of ecosystems in climate change mitigation or adaptation. Some of these contributions are even made conditional on the availability of international finance. Thus, planning for these synergies could enhance the potential for climate mitigation finance to contribute to Aichi Biodiversity Target 20 on the mobilization of financial resources for the implementation of the Strategic Plan on Biodiversity.

Beyond the results-based payments that may eventually be obtained through REDD+, the mobilization of financial resources is already demonstrated by the significant amounts of private sector finance that have been put forward in support of extensive programmes for reforestation and forest ecosystem restoration, discussed in Section 1.9.2.

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[52] Decision 1/CP.16 of the UNFCCC encouraged parties to undertake mitigation actions in the forest sector through the following activities, commonly known as REDD+: (a) Reducing emissions from deforestation; (b) Reducing emissions from forest degradation; (c) Conservation of forest carbon stocks; (d) Sustainable management of forests; (e) Enhancement of forest carbon stocks.

[53] Available at https://www.cbd.int/doc/meetings/cop/cop-12/information/cop-12-inf-15-en.pdf.

[54] Available at https://www.cbd.int/doc/meetings/sbstta/sbstta-20/information/sbstta-20-inf-30-en.pdf.

Box 3. Support tools – Modelling of future land use change to assess trade-offs between development, climate and biodiversity objectives: the REDD+ Policy Assessment Center (REDD-PAC) project

The REDD-PAC project aims at modelling future land-use change under different scenarios, including scenarios of REDD+ implementation. The results of the model can help assess the impact that various options for REDD+ implementation might have on other policy objectives, including the CBD objectives. The project was undertaken in two major forest regions: Brazil and the Congo Basin, based on regional adaptations of the global economic model Global Biosphere Management Model (GLOBIOM), developed by the International Institute for Applied Systems Analysis (IIASA), which produces spatially explicit projections of land use based on the demand from different sectors (agriculture, forestry and bioenergy), trade flows and national policies. Using a methodology developed by the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) and based on the International Union for Conservation of Nature (IUCN) species range data and other biodiversity-related spatial data, the results of the model were processed to identify how species of concern in an area would be impacted based on future land use change patterns in different scenarios.

In Brazil, the analysis revealed that individual species are affected differently by land use change that is projected to result from various scenarios of implementation of Brazil's new Forest Code. Projections showed that of 311 threatened species assessed, 20 species would lose over 25% of their potential habitat by 2050 in the business as usual scenario. Enforcing the Forest Code reduces this number to 6 species. The main areas under threat of conversion in scenarios of enforcement of the Forest Code are the dry forests of the Caatinga, projected to lose 11 Mha from 2010 to 2050, and some areas of the Cerrado.

In the Congo Basin, the management of Forest Concessions (FC) and Protected Areas (PA), as well as increasing agricultural yields, are potentially important options for achieving REDD+ objectives. There, the REDD-PAC project has assessed the potential impacts of changes in effectiveness of FCs and PAs, and of increases in agricultural yields, in preventing land use change. The results suggest that both PAs and FCs may play an important part in conserving forest cover and associated species habitat. Results indicate that increasing agricultural yields on existing croplands may also decrease the need for further deforestation and its impact on species, depending on how it is implemented.

Source: REDD-PAC project - http://www.redd-pac.org/new_page.php?contents=papers.csv

Box 4. Support tools – UN-REDD Safeguards and multiple benefits support

The support provided by the UN-REDD Programme on safeguards and multiple benefits in several countries provides examples of how biodiversity objectives can be taken into account at the planning stage through a range of spatial analyses that can inform the choice and location of REDD+ actions as part of country approaches to safeguards, as well as during national and subnational planning processes for REDD+. Approaches such as spatial analyses, benefit and risk assessments, among others, can inform choice, design and location of REDD+ actions in a way that fosters synergies with the achievement of the Aichi Biodiversity Targets and other policy objectives.

See the UN-REDD Programme's Multiple Benefits Country Resources hub
http://www.unredd.net/index.php?option=com_content&view=article&id=2328&Itemid=787

and Safeguards Knowledge page
http://www.unredd.net/index.php?option=com_unsubjects&view=unsubject&id=1&Itemid=491

1.9.1 Outlook based on national plans and reporting

Despite inclusion of a quantitative objective (the restoration of 15 per cent of degraded ecosystems), the measurement of progress on the restoration of degraded ecosystems presents conceptual difficulties. From an ecological perspective, degradation – as well as restoration– presents at least two dimensions: the extent of degraded area and the degree of degradation in each location. Quantifying restoration efforts runs up against this ambiguity, and the same 15% objective could in theory be realized by restoring a small area from a fully degraded to a fully restored state or a bigger area from a partially degraded to a partially restored state.[55] In theory, the relationship between the area of an ecosystem affected and the degree of degradation could be translated into a single metric, used to set national ambitions and track progress under the 15 per cent objective of Aichi Biodiversity Target 15.[56] However, the analysis of Parties' national reports shows that few Parties include clear quantitative metrics in the assessment of the current state of ecosystem degradation in their national target setting and in their reports of progress under Aichi Biodiversity Target 15.

The most common metric used in the national reports and NBSAPs for measuring and setting targets on degradation is the area of degraded ecosystems, especially for terrestrial ecosystems such as forests. Variables related to the degree of degradation were seldom presented, and related to ecosystems other than forests (freshwater quality in lakes or rivers) rather than being used in combination with information on the area of terrestrial degraded ecosystems (see also Section 1.7.1 above).

In the context of the implementation of the Strategic Plan on Biodiversity 2011-2020, Parties are free to interpret the Aichi Biodiversity Targets in their national context. Of the 62 countries reviewed, 50% had set a national target that clearly aligned with the objective of Aichi Biodiversity Target 15, and fewer had included a quantitative element in their national target. In the rare cases where countries have set a quantitative target under Target 15, they have either set it by referring to the area (in hectares) that will be placed under restoration measures, especially with regard to forests, or used a target percentage for the restoration of degraded ecosystem without explaining how this percentage would be measured.

A total of 27 countries or 44% were found to have set a quantitative national target for restoration using an area-based metric. Many metrics of degradation (and therefore restoration) are possible,[57] and a reference to area does not give any information as to the baseline and target degree of degradation to be achieved through these measures (e.g. the density of biomass carbon stocks, species richness, or degree of fragmentation). After area, carbon stock was the second most used metric for the setting of a quantitative national target for restoration, with 21 countries (34%) using this metric.

Area-based targets provide a useful indication of the level of ambition with regard to the achievement of Aichi Target 15. However, further information about the type of restoration actions to be undertaken is needed in order to assess the potential from these actions for the recovery of ecosystem functions, including the provision of services to people and habitat for species. (More information can be found in UNEP/CBD/COP/13/INF/11 on restoration of forest ecosystems at a landscape scale as a contribution to the achievement of the Aichi Biodiversity Targets.) Meaningfully implementing and monitoring progress under Aichi Target 15 would therefore require additional metrics than area for

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[55] Kotiaho et al. 2015: Target for ecosystem repair is impractical, *Nature* 519: 33.

[56] As pointed by Kotiaho et al., "damage to an ecosystem's condition [could] be reduced by 15% over an entire area of degraded landscape or, for example, by 33% in a randomly selected 45% of that area to attain the same reduction".

[57] A survey was conducted by FAO in 2009 on the use of indicators for forest degradation. Indicators listed by one or more countries included aesthetic values; area affected by fire; disappearance of biodiversity/species; erosion; forest/canopy cover; fragmentation; occupancy/dominance of invasive/introduced species; presence of pioneer species/indicator species; soil fertility; soil properties; soil structure; species composition; stock density; production/value of timber and non-wood forest products; water quality; wildlife habitats; and wildlife risk. See FAO (2011). *Assessing forest degradation Towards the development of globally applicable guidelines,* Forest Resources Assessment Working Paper 177. Accessible at http://www.fao.org/docrep/015/i2479e/i2479e00.pdf.

defining and assessing ecosystems, that can shed light on the quality and trajectory of restoration outcomes, both spatially and temporally.[58]

In addition, the fact that some national targets are purely area-based (e.g. natural forest cover will be increased to a certain percentage of the national territory by a certain date) means that they could be met through any combination of reduction in the rate of loss of existing natural ecosystems and restoration of degraded or converted areas. Some areas could even lose their forest cover and regain it within the implementation period for the target without affecting performance against such national targets, measured in net area of forest cover at the end of the period.

The adoption of "net forest cover" national targets risks betraying the spirit of the Strategic Plan on Biodiversity by allowing for significant impacts on biodiversity even if net cover targets were "successfully" met. Without knowing the respective proportions of avoided ecosystem loss and ecosystem restoration that will be used to meet Aichi Targets 5 and 15, the contribution of national efforts to the preservation of natural habitats for species is difficult to assess. Gains in natural ecosystems from restoration are not the "mirror-image opposite of loss",[59] and an area targeted for restoration cannot be considered to "cancel" the loss of an equivalent area of natural habitat.[60]

One solution could be for the Conference of the Parties to the CBD to provide further guidance to Parties with regard to the interpretation of these targets, emphasizing that the restoration of degraded ecosystems under Aichi Target 15 does not compensate for the loss of natural ecosystems that Aichi Target 5 seeks to reduce. This could encourage Parties to report separately on gross natural ecosystem loss and areas restored since the start of the Strategic Plan. The short-term action plan on ecosystem restoration,[61] recommended by CBD SBSTTA 20 as a flexible framework for action under Aichi Biodiversity Target 15 and other targets, could serve in the identification of national and subnational targets for ecosystem restoration and the planning of restoration actions, among other actions as contained in SBSTTA recommendation XX/12.

Further, certain elements of ecosystem degradation such as water quality or soil erosion do not lend themselves to a measurement by area. Other tracking and monitoring tools, and indicators, could be developed to measure other various aspects of ecosystem function, within and outside the areas designated for restoration. The reports reviewed show that some countries are already using indicators that can measure the degree of degradation of various ecosystems, such water quality, carbon stocks, fish stocks, richness and density of species. Indicators of fragmentation can also be used to assess degradation, such as the density of dams on waterways or forest fragmentation.

Where time series exists for these indicators, it may be possible to set individual targets that aim at achieving a certain value or trend for the indicator (e.g. at least 25% of species of fish stock show a population increase, and no more than 25% of them show a decrease between 2015 and 2020). Of the reports, 42% made use of at least one such indicator of the degree of degradation of ecosystems, often in relation to water quality in freshwater ecosystems and forest composition. Such types of indicators are especially useful since they can also provide information on the provision of ecosystem services, and therefore provide metrics for the measurement of progress under Aichi Biodiversity Target 14, in combination with data on the use of these services. However, despite the presentation of

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[58] Chazdon, R. L., P. H. Brancalion, L. Laestadius, A. Bennett-Curry, K. Buckingham, C. Kumar, J. Moll-Rocek, I. C. G. Vieira, and S. J. Wilson. 2016. When is a forest a forest? Forest concepts and definitions in the era of forest and landscape restoration. *Ambio* doi:10.1007/s13280-016-0772-y:1-13.

[59] Chazdon, R. L. (2014). *Second growth: The promise of tropical forest regeneration in an age of deforestation*. University of Chicago Press, Chicago, IL.

[60] Forest ecosystems illustrate well this difficulty: in most cases, their loss is concentrated and abrupt, and can be clearly measure through remote-sensing sources. Forest gain, in contrast, "is a highly variable, dispersed, and protracted process that is challenging to document and monitor with commonly used forest definitions and technology" – see Chazdon, above citation.

[61] UNEP/CBD/SBSTTA/REC/XX/12, available at https://www.cbd.int/doc/recommendations/sbstta-20/sbstta-20-rec-12-en.pdf.

this information, no quantitative national target was found that explicitly referred to the degree of restoration to be achieved, based on an indicator of ecosystem function.

Country examples – restoration

Restoration in **Burkina Faso** plays a vital role in strengthening the sustainable use of natural resources for all its citizens. Actions to be implemented under the National Rural Sector programme are expected to contribute to the Government's objectives of restoring 30,000 ha/year degraded forests; increasing plantations from 68,000 to 100,000 ha/year; increasing the area of natural forests from 170,000 to 500,000 ha; reducing the area of forests burned by wildfires from 30 to 20%; and training local villagers to sustainably manage natural resources.

Ghana is currently developing a forest plantation strategy to cover the period 2015-2040, including elements to restore its various savannah ecosystems affected by agricultural expansion, annual wildfires, logging and fuel wood harvesting, mining, and urbanization. The strategy in development includes plans by the government and private sector to reforest degraded forest lands by developing commercial forest plantations of recommended exotic and indigenous tree species at an annual rate of 20,000 ha over the next 25 years. Additionally, this strategy targets the maintenance and rehabilitation of an estimated 235,000 ha of existing forest plantations as well as enrichment planting of 100,000 ha of understocked forest reserves with high value indigenous timber species.

1.9.2 Outlook for implementation based on international and regional initiatives on forest and landscape restoration (Bonn Challenge, New York Declaration on Forests, Initiative 20x20, African Forest Landscape Restoration Initiative (AFR100))

Independently of national targets set under their NBSAPs or NDCs, several Parties to the CBD have pledged actions on forest restoration and reforestation under a number of international initiatives that seek to support climate change mitigation, adaptation, improve water provisions and meet other social and economic development goals. These initiatives represent a great potential to bolster the implementation of Aichi Biodiversity Target 15, and 5; however, their exact contributions to the achievements of these targets will depend on how and where they will be implemented.

The Bonn Challenge is a global effort to bring 150 million hectares of degraded and deforested land into restoration by 2020 and 350 million by 2030. The 2020 target was launched at a high-level event in Bonn in 2011 organized by the Government of Germany and the International Union for Conservation of Nature (IUCN), and was later endorsed and extended to 2030 by the New York Declaration on Forests of the 2014 UN Climate Summit.

The Bonn Challenge is an implementation vehicle for national priorities, such as water and food security and rural development, while simultaneously helping countries contribute to the achievement of international climate change, biodiversity and land degradation neutrality commitments. This includes Aichi Biodiversity Target 15, through the setting of area-based commitments by governmental and non-governmental organizations and other actors. As of September 2016 there have been 38 commitments to the Bonn Challenge from national and subnational governments, forest restoration pacts and private companies, totalling almost 125 million hectares, including 63.3 million hectares from Africa, 23.64 million hectares from Latin America and 22.38 million hectares from Asia. Members of the Global Partnership on Forest and Landscape Restoration (GPFLR) (forestlandscaperestoration.org) are providing policy and technical support to the definition and implementation of Bonn Challenge commitments around the world.

In addition, two regional platforms – the African Forest Landscape Restoration Initiative (AFR100) and Initiative 20x20 – have been launched in Africa and Latin America where they are fostering leadership and collaboration in support of forest landscape restoration and the Bonn Challenge, as well as other targets and programmes. AFR100 seeks to bring 100 million hectares of land in Africa into restoration by 2030, with a key focus on restoring the productivity of degraded and deforested lands and improving livelihoods. So far 13 countries have pledged to restore 41 million hectares of land, and 1 billion USD in development finance and 545 million USD in private sector

investment have been pledged in support of these efforts. In Latin America and the Caribbean, Initiative 20x20 is encouraging the implementation of sustainable climate-resilient agro-forestry and agro-pastoral systems, assisted or natural regeneration and five million hectares of avoided deforestation. The initiative is aiming to leverage 1 billion USD in finance to pursue its goals and has already received expressions of ambition representing 830 million USD from the private sector.

In 2014, at the first Asia-Pacific Rainforest Summit, stakeholders including those from the governments involved in the Asia-Pacific region, donor countries, leading civil society organizations and international forestry agencies, supported a proposal to work together to develop an Asia-Pacific Rainforest Recovery Plan.[62] The Plan includes goals of *halving the rate of loss of rainforests in the region by 2020; ending natural rainforest loss in the region by 2030 by adopting the principles of sustainable forest management; encouraging the private sector to eliminate rainforest deforestation from the production of palm oil, paper and timber products no later than 2020; restoring an agreed area of degraded rainforests in the region by 2020, and increasing targets by 2030.* Australia has established a secretariat to work with all regional stakeholders to further develop an Asia-Pacific Rainforest Recovery Plan with extensive engagement with regional governments.

The ambition of the Asia-Pacific Rainforest Recovery Plan is to harness new technologies and approaches emerging in the region to restore degraded landscapes. It seeks to engage with a variety of stakeholder such as the private sector, government agencies, the investment sector, local communities, indigenous groups and all other relevant stakeholders as a way of analysing the cost–benefits of forest landscapes restoration and identifying appropriate restoration opportunities. Regional cooperation is encouraged to support national restoration activities, among other things to provide information and technical guidance and coordinate the many international organizations working on restoration in the region. Supporting programmes will document indigenous knowledge, skills and practices on the propagation of native species. Finally, the plan includes the transformation of research and demonstration sites into "learning centres of excellence" for collaborative forest restoration research and institutional development, to underpin green investment in forests.

There is a clear potential for all these initiatives and various expressions of ambition to contribute to progress under Aichi Biodiversity Targets 5 and 15; however, the exact extent of this contribution will be determined by the specific actions that countries are taking to implement them and where these actions take place. Several Parties are in the process of conducting national-scale assessment of forest and landscape restoration opportunities, sometimes with technical and policy support from IUCN, WRI, CBD, UNEP, FAO and other members of the GPFLR, as well as financial support from donors, including the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety of Germany (BMUB), the United Kingdom Department for International Development (DFID), Norway's International Climate and Forest Initiative (NICFI), and the World Bank, among others. Box 5 presents a support tool for conducting national-scale assessments of restoration opportunities.

Actions aiming to restore ecosystems to their natural state, through natural or assisted regeneration or even remediation, depending on the level of degradation of the ecosystem, directly support the achievement of Aichi Biodiversity Target 15. Other restoration actions, set within a broader landscape, such as the development of agro-forestry and sustainable agro-pastoral activities, as well as the development of sustainably managed forest plantations, could contribute to Aichi Biodiversity Target 7 and serve to reduce pressure on land use conversion, while meeting food, fuel and other development needs.

Other types of actions that might be undertaken with the objective of increasing forest cover, such as the afforestation of natural areas of grassland[63] or the conversion of degraded forests to monospecific plantations, may provide little

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[62] See also Appanah, S., D. Lamb, P. Durst, T. L. Thaung, C. Sabogal, D. Gritten, B. Mohns, J. Atkinson, and K. Shono (eds). 2016. Forest landscape restoration for Asia-Pacific forests: a synthesis. FAO/RECOFTC.

[63] Veldman et al. (2015). Tyranny of trees in grassy biomes, *Science,* 347(6221), p. 484-485.

benefit in terms of biodiversity and may have negative impacts on some ecosystem services and work against the objectives of Aichi Biodiversity Targets 5 and 15. For this reason, a fundamental first step in the forest landscape restoration (FLR) process involves understanding the ecosystem at the landscape level, including its historical and cultural values, before making decisions on a restoration approach.[64] Box 5 presents voluntary FLR principles.

1.9.3 Outlook to 2018 - sixth national report to the CBD

In undertaking more detailed planning of how pledges will be realized to advance international and regional initiatives on forests and landscape restoration, countries may wish to consider the role of restoration of natural ecosystems, through natural regeneration or, where degradation is more severe, active interventions, and the potential for synergies with their national biodiversity targets, as expressed in countries' NBSAPs. These efforts may require further consideration, including in the early stages of planning of restoration actions, such as when carrying out pre-assessments of restoration opportunities.

At the country level, a similar analysis of deforested areas and degraded forest areas from the same data, compared with areas pledged for reforestation and restoration under the Bonn Challenge, reveals that in many of the countries that have made such pledges, the area pledged represents a significant proportion of the overall area of restoration opportunity identified through the application of the ROAM, sometimes greater than the 15% that Aichi Biodiversity Target 15 aims to reach. See Figure 7 on the proportion of areas with potential for restoration covered by national restoration ambitions**.**

This is a mere indication, as two important caveats need to be considered before using these results to measure the potential contribution of these commitments to Aichi Biodiversity Target 15. The first one is that there is currently little clarity over how countries intend to implement these commitments. Reforestation and restoration targets can be met through a variety of actions that are more or less aligned with biodiversity objectives. The second one is that forests, currently the main focus of these initiatives, are only one of many natural ecosystems that may be degraded and in need of restoration.

Current national reporting to the CBD shows that most countries have yet to make explicit links between these global initiatives and Aichi Biodiversity Target 15. Countries that have made area-based pledges for restoration often do not include a quantitative commitment under Aichi Biodiversity Target 15. This may be explained by the fact that these ambitions were only recently expressed or may have been expressed by different agencies.

Further, it is often unclear whether these ambitions are additional to previously expressed targets for restoration, be it the restoration of natural ecosystems in support of Aichi Biodiversity Target 15 or a target for carbon sinks through reforestation contained in a country's NDC. Furthermore, in many cases the details of how they will be implemented on the ground – and therefore their potential to contribute to biodiversity objectives – remains to be determined. While defining the implementation details for national restoration plans, Parties should strive to enhance intra- and inter-ministerial coordination in order to ensure a convergence between their national restoration plans and NBSAPs, and to ensure adequate resources to implement these.

The sixth national reports to the CBD, due in 2018, could be an opportunity to report on the consolidation of different goals and ambitions across diverse forums. Such commitments could also be included in further revisions of NBSAPs, as appropriate, acknowledging that national contributions to achieve the global Aichi Biodiversity Targets of the Strategic Plan for Biodiversity 2011-2020 could be leveraged through coordinated actions with other intergovernmental processes and voluntary initiatives.

To this end, the indicative list of data elements compiled for this review could be included in the resource materials for the preparation of the sixth national report to the CBD, with a view to helping inform national reporting under Aichi

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[64] See Laestadius L., et al. *Science*. 2015 Mar 13, 347(6227):1210-1; and DeWitt S et al. *Science*. 2016 Mar 4, 351(6277):1036.

Biodiversity Targets 5 and 15, in particular with regard to the inclusion of quantitative and spatially explicit data. Moreover, the assessment presented in this report could also contribute to the review of SDG targets 15.2 and 15.1 when preparing for the 2018 session of the High-level Political Forum on Sustainable Development. Opportunities should be further considered on how best to contribute to this session of the High-level Political Forum.

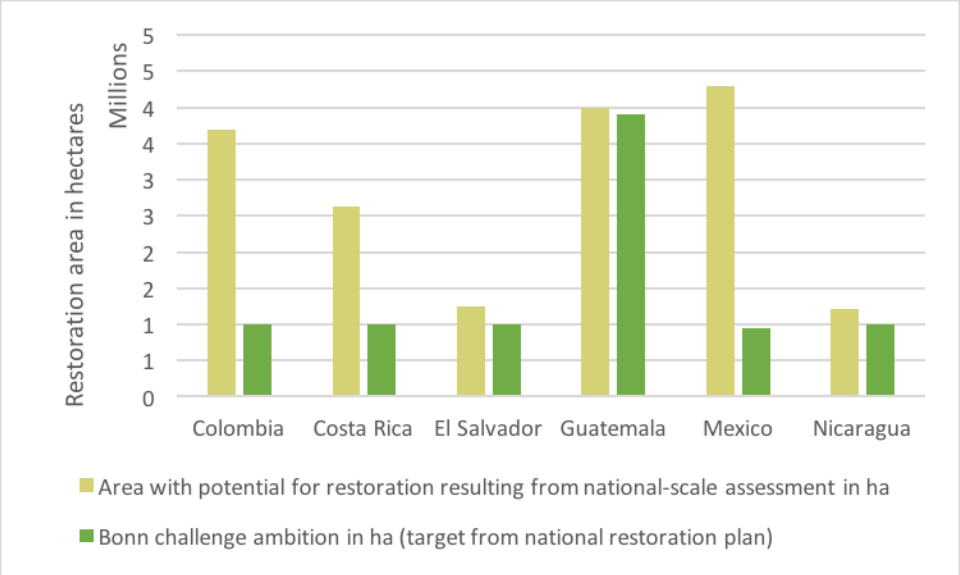

Figure 7 – Proportion of areas with potential for restoration covered by national restoration ambitions. (Source: IUCN report on the application of ROAM methodologies for the assessment of restoration opportunities at the national scale)

Box 5. Support tools – The Restoration Opportunities Assessment Methodology (ROAM) and voluntary forest landscape restoration (FLR) principles

The Restoration Opportunities Assessment Methodology (ROAM), produced by IUCN and the World Resources Institute (WRI), provides a flexible and affordable framework approach for countries to rapidly identify and analyse forest landscape restoration (FLR) potentials and locate specific areas of opportunity at a national or subnational level. ROAM is being rolled out in a number of countries that have made pledges under the Bonn Challenge, including Costa Rica, El Salvador, Guatemala, Mexico and Nicaragua in Latin America.

A ROAM assessment can be undertaken by a small core assessment team through collaborative engagement with other experts and stakeholders and can deliver the following products:

- Identified priority areas for restoration;
- A shortlist of the most relevant and feasible restoration intervention types across the assessment area;
- Quantified costs and benefits of each intervention type;
- Estimated values of additional carbon sequestered by these intervention types;
- Analysis of the finance and investment options for restoration in the assessment area; and
- A diagnostic of "restoration readiness" and strategies for addressing major policy and institutional bottlenecks.

By implementing ROAM, decision makers and stakeholders can expect to deliver the following types of outcomes:

- Better information for improved land-use decision-making;
- High-level political support for forest landscape restoration;
- Fundamental inputs to national strategies on forest landscape restoration, REDD+, adaptation and biodiversity, among others, and for mutually reinforcing convergence between such strategies;
- A basis for better allocation of resources within restoration programmes;
- Engagement of and collaboration among key policymakers and decision makers from different sectors, as well as other stakeholders with interests in how landscapes are managed;
- Shared understanding of forest landscape restoration opportunities and the value of multifunctional landscapes.

Voluntary FLR principles

At its inception in 2003, the Global Partnership on Forest and Landscape Restoration, a coalition of organizations with the common goal of restoring the world's degraded and deforested lands, agreed on the following voluntary FLR principles:

1. Restoring an agreed, balanced package of landscape functions, not only increasing forest cover and not trying to re-establish the forests of the past;
2. Working across whole landscapes containing mosaics of land uses, not just individual sites, so trade-offs can be made;
3. Using of a range of restoration options from natural regeneration to tree planting as appropriate;
4. Active negotiation and collaboration among stakeholders;
5. Avoiding further reduction or conversion of natural forest cover and other ecosystems;
6. Tailoring to local conditions, continuously learning and adapting to changes in these.

More information can be found in UNEP/CBD/COP/13/INF/11, on restoration of forest ecosystems at a landscape scale as a contribution to the achievement of the Aichi Targets, as well as under the following links:
IUCN ROAM website: https://www.iucn.org/theme/forests/our-work/forest-landscape-restoration/restoration-opportunities-assessment-methodology;
GPFLR website: http://www.forestlandscaperestoration.org/.

III. CONCLUSIONS AND RECOMMENDATIONS

Greater efforts are needed in order to meet the objectives set globally under Aichi Biodiversity Targets 5 and 15 to halve and where possible bring close to zero the rate of loss of all natural habitats, including forests; to significantly reduce degradation and fragmentation; to enhance ecosystem resilience through conservation and restoration, thereby contributing to climate change adaptation and to combating desertification; and to enhance the contribution of biodiversity to carbon stocks through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation.

The main conclusion from this review is that the complexity of the data needed to adequately establish baselines, set targets and measure progress against the various elements of Targets 5 and 15 at the national level appears to far exceed the capacity (human, technical or financial) of many developing countries. Further support from the Global Environment Facility, and other implementing agencies, along with different initiatives, including the Forest Ecosystem Restoration Initiative (FERI), could be further mobilized to build capacities in terms of national target setting, planning, implementation and reporting functions, including through direct support and the development of information portals and toolkits. Efforts could be made, following the principles under consideration in the CBD SBSTTA 20 recommendation for a short-term action plan on ecosystem restoration (2017-2020) to enhance and support capacity development and technical and scientific cooperation for the implementation of the Strategic Plan for Biodiversity 2011-2020.[65] This conclusion supports the findings of the national capacity self-assessments conducted between 2003 and 2010 with support from UNDP-GEF,[66] in which many countries noted that effective implementation of the Convention was hindered mostly by limited capacities, financial and technical resources and a lack of information.[67]

Limited global progress towards these targets must not mask the contrasting situations that can be observed at the regional and national scale, pointing at the value of promoting South-South learning exchanges and collaboration, through, inter alia, regional workshops and direct support. In Latin America, the

[65] UNEP/CBD/SBI/1/6/Add.1.

[66] The funding was provided by the Global Environment Facility (GEF) through the United Nations Development Programme (UNDP).

[67] See the NCSA synthesis report and the individual country NCSAs at https://www.thegef.org/gef/ncsa.

abatement of natural forest loss by 50% by 2020 may be achievable if current efforts are continued and improved. The sum of ecosystem restoration pledges in the region is also significant, showing signs that the quantitative objective of Target 15 could potentially be within reach. While such an area is yet to be under active restoration and more assessments are needed to understand how these pledges will be implemented on the ground, the political commitment indicates that efforts will be taken to bring a significant fraction of degraded areas under restoration by 2020, contributing to the 15% target. The situation in Asia is contrasted: very high rates of natural forest loss still prevail in high forest cover and high biodiversity countries and large-scale reforestation programmes are being implemented in countries with much greater reduction of forest cover. The outlook for Africa, on the other hand, is particularly concerning with a clear acceleration of the rates of natural ecosystem loss since the adoption of the Strategic Plan for Biodiversity 2011-2020. Efforts to curb deforestation are under way with many African countries receiving support for the planning of REDD+ and forest and landscape restoration efforts but will face challenges in achieving the Aichi Biodiversity Targets by 2020. Further significant differences can be observed at the national scale within these three regions.

The review of national reports and NBSAPs reveals considerable variation among countries in the amount, level of detail and type of information provided with regard to the assessment of status and trends of natural ecosystems and the setting of national targets. The objectives set by the targets at the global scale can only be achieved if Parties to the CBD set national targets that are specific, measurable and time-bound. In turn, the meaningful setting of such national targets requires the gathering of quantitative and, ideally, spatially explicit data on past and current rates of loss, degradation and fragmentation, as well as adequate resources, including human, financial and technical, to implement and monitor impacts.

Many countries appear to be lacking the kind of quantitative and spatial baseline data that would be needed in order to meaningfully plan, implement and monitor national action to achieve quantitative elements set under the Aichi Biodiversity Targets (i.e. 50% reduction of the rate of loss of natural habitats, restoration of 15% of degraded ecosystems). A range of free, open access information is available or in development which can help countries improve these data. The low proportion of countries that provided quantitative information, and the differences in the metrics used, also suggest that a meaningful regional-scale or global-scale assessment of progress under Targets 5 and 15 will be difficult to derive from the aggregation of national reporting. For the 62 countries reviewed, national focal points in charge of reporting to the CBD may find under their nationally-specific "country dossiers" (available here or at https://chm.cbd.int - type "country dossier" and your country name in the search box) a gap analysis of their latest national report, which could help them identify priority data gaps and elements of their targets to be specified.

The prominence of forests, both in terms of available global indicators and data presented in national reports, is striking. The greater availability of information with regard to forests relative to other natural ecosystems may reflect the importance of forest ecosystems for a wide range of global and local ecosystem services, including climate change mitigation and adaptation, as well as fuel, food, water, disaster risk reduction, and sustainable livelihoods. However, from the standpoint of biodiversity, national targets should be representative of the diversity of all natural ecosystems. The current emphasis on forests could provide an example for the conservation and sustainable use of a wider variety of natural ecosystems. However, further data collection efforts are required on the extent and state of other natural ecosystems (such as aquatic biomes, grassland, drylands) to address Aichi Biodiversity Target 5.

Global and national-scale information on the state of degradation and fragmentation of ecosystems is lacking. Efforts under way by GEO BON[68] represent a commendable effort to fill this gap with regard to degradation. However, given the specific dimensions of degradation for various ecosystems, further efforts are required to develop

[68] Group on Earth Observations Biodiversity Observation Network – www.geobon.org.

specific indicators for degradation and fragmentation. This information is also crucial to help countries further define how national action under Aichi Biodiversity Targets 5 and 15 specifically addresses the conservation and restoration of "natural" habitats. This aspect appears to be overlooked by many forest-related national targets, expressed in "net" terms. Net deforestation targets equate the value of protecting native forests with that of planting new ones, and risk masking significant impacts on natural habitats and biodiversity. **The resource materials and guidelines for national reporting to the CBD, and to other forest-related processes, could encourage countries to systematically report on both gross and net forest loss, and gross and net loss of other ecosystems, and to set national targets for gross loss and gain separately.**

National targets are only one element in the planning of national action to implement Aichi Biodiversity Targets 5 and 15. Specific implementation measures should be designed to address the drivers of ecosystem loss and degradation, and to advance actions to reverse these trends through ecosystem restoration. A first indication of priority considerations towards the design of these measures may be derived from the responses of country representatives to the online questionnaire and exercises conducted during the regional capacity development workshops.[69] The effectiveness of these implementation measures should be monitored to ensure that they can be adaptively managed. Ideally, the planning of the implementation process should be iterative: once implementation measures are listed, planned and budgeted for, countries may wish to consider whether the intended target is realistic and whether its level of ambition should be raised or lowered. Including more information in national reports on these implementation measures, their degree of effectiveness and the challenges met in their application could also help foster a process of mutual learning among Parties on how they might be best able to reach their national targets.

Parties could make further use of potential synergies among activities related to Aichi Biodiversity Targets 5 and 15 and related conventions and international agendas such as the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs). For example, the 2030 Agenda for Sustainable Development and the SDGs, as well as the Paris Agreement, have demonstrable links that connect biodiversity, climate change and development. Moreover, forests and other land use sectors are essential for the implementation of these agendas. In this regard, countries that have completed elements of a REDD+ framework could make use of such information when preparing their sixth national reports, and could provide details on how actions under Aichi Biodiversity Targets 5 and 15, in their NBSAPs, align with their REDD+ National Strategies or Action Plans. Synergies may also exist with national efforts to achieve a Land Degradation Neutrality objective under the UNCCD, as well as data collected to report on progress under this objective.

Furthermore, many nationally determined contributions (NDCs) are directly linked to the achievement of SDG 15.[70] The implementation of these contributions of developing countries under the UNFCCC – concerning the role of ecosystems in climate change mitigation or adaptation – may well receive financial support from the Green Climate Fund and other financial mechanisms. The development of specific criteria and safeguards could potentially foster links with the objectives of the Strategic Plan for Biodiversity 2011-2020.

Progress on targets reported to the CBD in national reports and NBSAPs can be informed by synergies with existing ecosystem conservation and restoration commitments under other forums. The NBSAP should be viewed and used as a "living" planning document, adapting to changing needs and commitments. It could also seek new ways to incorporate relevant and appropriate national pledges and programmed implementation, whenever they arise (see annex for examples based on a review of national targets and commitments under other forums). This could present an opportunity to mainstream the objectives of Aichi Biodiversity Targets 5 and 15, as well as the wider

[69] Further information can be consulted under the "implementation" section of the country dossiers (available at www.feri-biodiversity.org/country-data).

[70] SDG 15: "Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss."

objectives of the Strategic Plan for Biodiversity 2011-2020, within programmes that may have climate change mitigation or restoration of land productivity as a primary objective.

In undertaking more detailed planning of how restoration ambitions will be realized, countries may wish to consider the role of natural regeneration versus active interventions, depending on the circumstances faced. Various tools and methodologies, some of which are presented in this report, are available to help plan restoration actions and assess restoration opportunities. Parties may also wish to refer to the short-term action plan for ecosystem restoration recommended by SBSTTA 20 (UNEP/CBD/SBSTTA/REC/XX/12).

Of the 62 countries reviewed, 21 had officially adopted their revised NBSAP. This is a cause for concern with regard to the achievement of Aichi Biodiversity Target 17, which calls on Parties to develop and adopt their NBSAP as a policy instrument by 2015. It also impedes an assessment of the global outlook for meeting the Aichi Targets through an aggregation of national objectives (although many Parties provided an indication of what their national targets might be in their fifth national report). However, for those countries that have yet to adopt an updated NBSAP, this could also be seen as an opportunity to strengthen their national targets based on some of the recommendations made in this report, including through a better integration with existing national targets under other multilateral environmental agreements such as UNFCCC and UNCCD, or through voluntary initiatives such as the Bonn Challenge.

Annex

Analysis of alignment between quantitative area-based or carbon-based AFOLU, LULUCF or REDD+ contributions in nationally determined contributions (NDCs), Bonn Challenge Commitments, and national targets under Aichi Biodiversity Target 15

Countries with a quantitative ecosystem restoration commitment within nationally determined contributions under the United Nations Framework Convention on Climate Change (UNFCCC), or voluntary commitments under the Bonn Challenge, and a quantitative element in their national target(s) under Aichi Biodiversity Target 15, may wish to clarify how these commitments are articulated in their revised national biodiversity strategy and action plan (NBSAP), where possible, or in further detailed implementation plans where the revised NBSAP has already been adopted.

Countries that do not yet include a quantitative element in their national target(s) or have yet to adopt a national target under Aichi Biodiversity Target 15 may wish to consider the inclusion of a quantitative restoration target, either in their revised NBSAP or in further implementation plans.

This revised target or clarification should ideally build on other, related restoration commitments under UNFCCC, and where relevant the Bonn Challenge, and indicate how such commitments are articulated, covering the following points:

- How area-based and forest cover restoration targets relate to the extent of degraded ecosystems, to determine what percentage of degraded ecosystems is targeted for restoration and how that percentage compares to the 15 per cent target under Aichi Biodiversity Target 15;
- How quantitative forest cover targets relate to the area-based targets for forest landscape restoration (only a fraction of which may result in actual increase in forest cover);
- How the restoration techniques used, types of ecosystems targeted and location of restoration actions will allow for the achievement of carbon or volume-based quantitative targets under the UNFCCC while preserving a balance of ecosystem services and restoration of natural habitats.

Selected countries	Quantitative area-based nationally determined contribution in the AFOLU or LULUCF sectors under UNFCCC[71]	Other quantitative nationally determined contribution in the AFOLU or LULUCF sectors under UNFCCC	Bonn Challenge forest landscape restoration voluntary commitment	Revised NBSAP (since October 2010)	National target under Aichi Biodiversity Target 15, with an emphasis on the quantitative elements, where present
Countries with quantitative restoration commitments under the UNFCCC and/or the Bonn Challenge and a quantitative element in their national targets under Aichi Biodiversity Target 15					
Brazil	Restoring and reforesting 12 million hectares of forests by 2030	In the Brazilian Amazonia, zero illegal deforestation by 2030 and compensating for greenhouse gas emissions from legal suppression of vegetation by 2030	1,000,000 hectares (Atlantic Forest Restoration Pact)	✓	*"By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced through conservation and restoration actions, including restoration of **at least 15% of degraded ecosystems**, prioritizing the most degraded biomes, hydrographic regions and ecoregions, thereby contributing to climate change mitigation and adaptation and to combating desertification."*

[71] AFOLU: Agriculture, Forestry and Other Land Use; LULUCF: Land Use, Land Use Change and Forestry.

Selected countries	Quantitative area-based nationally determined contribution in the AFOLU or LULUCF sectors under UNFCCC[71]	Other quantitative nationally determined contribution in the AFOLU or LULUCF sectors under UNFCCC	Bonn Challenge forest landscape restoration voluntary commitment	Revised NBSAP (since October 2010)	National target under Aichi Biodiversity Target 15, with an emphasis on the quantitative elements, where present
Guatemala	Restore 1,200,000 of forest landscapes	-	1,200,000 hectares	✓	*"By 2022, **15% of biological diversity and its ecosystem services** will have been restored, improving its capacity of adaptation to climate change and contributing to reduce socio-environmental vulnerability."* [unofficial translation from Spanish]
China	40 million hectares increase in forest cover by 2030 as compared to 2005	1.3 billion cubic meter increase in forest stock volume as compared to 2005		-	Preliminary national target from fifth national report: *"- By 2020, forest areas will **be increased by 52,000 km² over that in 2010, and forest reserves net increased by 1.1 billion km² over that in 2010, and forest carbon sinks by 416 million tons.*** *- By 2020, the total areas of control of degraded grasslands will exceed **1.65 million km²,** with grassland habitats obviously restored and grassland productivity significantly enhanced.* *- By 2020, the aquatic environment and ecology will be gradually restored."*
Lao People's Democratic Republic	70% forest cover by 2020 and maintain this through 2030 (National Forest Strategy) (Conditional target)	-		-	Preliminary national target from fifth national report: *"Efforts are in place to restore forest lands and forest regeneration is listed as one of the main REDD+ activities to be implemented as part of the Carbon Fund Emission Reduction Programme.* *Efforts have been made to restore 444 ha of forests, with another **1,000 ha of forest to be restored by 2019** (BCC Project – ADB)."*

Selected countries	Quantitative area-based nationally determined contribution in the AFOLU or LULUCF sectors under UNFCCC[71]	Other quantitative nationally determined contribution in the AFOLU or LULUCF sectors under UNFCCC	Bonn Challenge forest landscape restoration voluntary commitment	Revised NBSAP (since October 2010)	National target under Aichi Biodiversity Target 15, with an emphasis on the quantitative elements, where present
Nepal	40% of the total area of the country under forests	-		✓	*"Replicating and expanding the successful leasehold forestry model in feasible areas.* ***At least 5,000 hectares additional degraded forests to be covered by 2020.*** *Implementation of PES and REDD+ where feasible. This, among other, include […] developing and implementing safeguards against possible negative effects of REDD+ implementation on biodiversity.* ***At least 5 per cent of the forest ecosystems to come under REDD+ implementation by 2020.*** *Controlling encroachment and eutrophication in at least 10 major wetlands and restoring at least 5 major degraded wetlands by 2020.* *Designing and implementation of ecosystem based adaptation programmes in the mountains. By 2020,* ***at least 10,000 hectares degraded mountain ecosystems to be restored*** *through participatory approach."*
Countries with quantitative restoration commitments under the UNFCCC and/or the Bonn Challenge and no quantitative element in their national targets under Aichi Biodiversity Target 15					
Cambodia	Increase forest cover from 57 to 60%	4.7 tCO_2 eq/ha/year		-	Preliminary national target from fifth national report: *"By 2020, ecosystems and their functioning have been restored and preserved benefiting local communities particularly women, old person, children and indigenous people."*
Ecuador	Restore 500,000 hectares of forest by 2017 and 1,300,000 by 2025	-	500,000 hectares	-	Preliminary national target from fifth national report: *"Ecuador recuperates degraded habitats with a view to mitigate climate change and provide ecosystem goods and services essential to changing to matrix of production and to the well-being of the population."* [unofficial translation from Spanish]
India	Bring 33% of its geographical area under forest cover eventually	Carbon sink of 2.5 to 3 billion tonnes of CO_2 equivalent through additional forest and tree cover by 2030.	13,000,000 hectares	✓	*"Strategies for reducing rate of degradation, fragmentation and loss of all natural habitats are finalized and actions put in place by 2020 for environmental amelioration and human well-being."*

Selected countries	Quantitative area-based nationally determined contribution in the AFOLU or LULUCF sectors under UNFCCC[71]	Other quantitative nationally determined contribution in the AFOLU or LULUCF sectors under UNFCCC	Bonn Challenge forest landscape restoration voluntary commitment	Revised NBSAP (since October 2010)	National target under Aichi Biodiversity Target 15, with an emphasis on the quantitative elements, where present
Countries with quantitative restoration commitments under the UNFCCC and/or the Bonn Challenge and no national target identified under Aichi Biodiversity Target 15					
Belize	Increase forest area by 4.5 million hectares by 2030	-	3,900,000 hectares	-	No national target identified
Chile	Development and recovery of 100,000 hectares of forest land	Greenhouse gas sequestration and reduction of 600 000 T CO_2 by 2030	500,000 hectares	-	No national target identified
Honduras	Afforestation and reforestation of 1 million hectares by 2030	Reduce by 39% household consumption of fuel wood	1,000,000 hectares	-	No national target identified
Sri Lanka	Forest cover increase from 29 to 32% by 2030	10% emission reduction in forest sector		-	No national target identified