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ACTIONS TO MAINSTREAM BIODIVERSITY INTO SUSTAINABLE FOREST MANAGEMENT

Note by the Executive Secretary

I. INTRODUCTION

1. In response to decision XII/1, the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA19), at its nineteenth meeting, reviewed the main implications and findings of the fourth edition of the *Global Biodiversity Outlook* (GBO-4), and its underlying technical reports, as well as additional information from fifth national reports and other submissions. The document also took into account a related request by the Conference of the Parties concerning the Executive Secretary and the Food and Agriculture Organization of the United Nations strengthening their collaboration on relevant matters (decision XII/6, paragraph 17, 21). Moreover, in its multi-year programme of work (decision XII/31), the Conference of the Parties decided, inter alia, to consider at its thirteenth meeting the implications of the findings of GBO-4 and strategic actions to enhance national implementation, in particular through mainstreaming and the integration of biodiversity across relevant sectors, including agriculture, forests and fisheries.1

2. Following SBSTTA19 recommendation XIX/12 the Executive Secretary was requested to arrange for the peer review of information document UNEP/CBD/SBSTTA/19/INF/17, to revise them in collaboration with the Food and Agriculture Organization of the United Nations and other relevant organizations and to make them available to the Subsidiary Body on Scientific, Technical and Technological Advice at its twentieth meeting and to the Subsidiary Body on Implementation at its first meeting. The report also takes into account recommendations from SBSTTA19 Decision XIX/8.[3]

* UNEP/CBD/SBSTTA/20/1/Rev.1
** UNEP/CBD/SBI/1/1/Rev.1.

1 Item 10 of provisional agenda for COP 3.

[2] Recommendation XIX/1 on further considerations of the implications of the findings of the fourth edition of the GBO-4 and related reports, including with respect to the mainstreaming of biodiversity across sectors.

[3] Recommendation XIX/8. Forest biodiversity: Role of international organizations in supporting the achievement of the Aichi Biodiversity Targets.

3. Pursuant to these decisions, this document updates UNEP/CBD/SBSTTA/19/INF/17 with input received from four Parties and three organizations.4 Several Information documents were also presented to complement the report. The International Model Forest Network (IMFN) presented an information note (UNEP/CBD/SBSTTA/20/INF/41) related to mainstreaming ecosystem restoration and biodiversity conservation, with three case studies focusing on participatory governance models for conservation in a biodiversity hotspot in Ecuador, landscape restoration around Lake Karago (Gishwati) in Rwanda, and moose conservation in central Canada. This document also demonstrates mainstreaming in supports of Article 8(f) of the Convention which calls on Parties to "rehabilitate and restore degraded ecosystems and promote the recovery of threatened species, inter alia, through the development and implementation of plans and other management strategies." The International Union of Forest Research Organizations (IUFRO), including its Unit "Forest policy learning architectures", and Yale University's Governance, Environment and Markets (GEM) Initiative also provided two information notes (UNEP/CBD/SBSTTA/20/INF/76) addressing the role of legal verification in enhancing local rights to forest resources - Piloting the policy learning protocol in the Peruvian forest context and (UNEP/CBD/SBSTTA/20/INF/75) presenting the protocol for policy learning through the pathways of influence.

4. The Executive Secretary also provided information note UNEP/CBD/SBSTTA/20/INF/55 illustrating an array of support tools and voluntary guidance to support the biodiversity mainstreaming in forest management practices. The Food and Agriculture Organization of the United Nations (FAO) provided an information note on guidance for the achievement of Aichi Biodiversity Target 7 for food and agriculture (UNEP/CBD/SBSTTA/20/INF/53) and guidance on building a common vision for sustainable food and agriculture (UNEP/CBD/SBSTTA/20/INF/54).

II. IMPLICATIONS AND OPPORTUNITIES FOR MAINSTREAMING BIODIVERSITY INTO FORESTS AND FORESTRY PRACTICES

A. Findings from FRA 2015

5. The Global Forest Resources Assessment (FRA) 2015, of the Food and Agriculture Organization of the United Nations (FAO), is the latest report, to date, on the world's forests and their resources. Since 1990 and every five years since 2000, countries have been providing information through the FRA on forest conditions, their resources, management and use in all countries, including on the extent of natural forest. FRA reports draw from a combination of sources. Generally these are based on ground-based measurement/assessments and remote sensing at the national scale.

6. 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". While FAO states that natural forest must have 50% of their growing stock stems of natural origin, many additional criteria have been proposed for what should constitute "natural forest", including how the forest was established (through natural re-generation or planting), the origin of the tree species, the degree of human intervention (also known as "intactness") and ecological functioning.5 This means that all forests, but those that are clearly the result of active commercial plantations or where assisted natural regeneration is called plantation, may be included as a natural forest.

7. In relation to biodiversity, FRA 2015 data includes information on the: area of forest protected for

[4] Argentina, Brazil, Canada, Mexico, FAO, Global Forest Coalition (ICCA) and UNEP, WCMC.

[5] Lisen Runsten and Lera Miles, *Defining "Natural Forest": Implications for REDD+ Planning* (Cambridge: UNEP-WCMC, forthcoming).

conservation; area of forest protected for soil and water protection; area of forest; area of primary forest; area of plantation; area of forest affected by IAS; area of forest certified; and progress in sustainable forest management (SFM) policy. Of relevance to biodiversity, the data indicates that:

a. Nearly one-third of the Earth's land area—almost four billion hectares—is covered by forests. Since 1990, there has been a change of forest from 31.6% of global land area, to 30.6% in 2015. 4,128 million ha of forest in 1990 decreased to 3,999 million ha in 2015. This indicates a net loss of nearly 129 million ha of forest (natural and planted) from 1990 to 2015, representing a rate of –0.13%/year.
b. Between 2010 and 2015, there was an annual loss of 7.6 million ha and an annual gain of 4.3 million ha per year (i.e., planted forest), resulting in a net annual decrease in forest area of 3.3 million ha per year. The biggest forest area loss occurred in the tropics, particularly in South America and Africa.

c. The bulk of the world's forest is natural forest, amounting to 93 percent of global forest area or 3.7 billion ha in 2015. From 2010 to 2015, natural forest decreased by a net 6.6 million ha per year (8.8 million ha of loss and 2.2 million ha of natural forest gain).

d. Since 1990, 38 million ha of primary forest have been reported as modified or cleared by countries reporting in all years. The total reported primary forest area, however, has increased from 1990 to 2015, largely because more countries now report on this forest characteristic, although often using different criteria.

e. The conservation of biodiversity represents the primary management objective for 13% of the world's forests and, since 1990, 150 million ha of forest have been added to the conservation category. Forests designated for the protection of soil and water represent 25% of the total forest area. During 2010-2015, forest within protected areas increased, as a percentage of total forest area in reporting countries. It rose from 16% to 29% in the tropics and from 10% to 16% globally over the period, 1990-2015. The largest reported percentage of forest area in protected status was in the tropics domain, but still less than forest area loss.

f. Forest designated as multiple use increased from 23 percent of total forest area to 26 percent between 1990–2015. Multiple-use forest provides timber, range, non-wood forest products, water, recreation and wildlife management values. These increases in proportion come in part from stable designations and decreasing total forest areas.

g. Planted forest area has increased by over 110 million ha since 1990 and accounts for 7% of the world's forest area. The average annual rate of increase between 1990 and 2000 was 3.6 million ha. The rate peaked at 5.2 million ha per year for the period 2000 to 2010 and slowed to 3.1 million ha (2010–2015) per year, as planting decreased. During this period planted forests increased by a net 3.1 million ha per year (3.5 million ha of planted forest gain and 0.4 million ha of planted forest loss).

h. Reduced forest stocking is less visible but it is an important reality in many parts of the world. Over the past 25 years global carbon stocks in forest biomass decreased by almost 17.4 Gt. This reduction was mainly driven by conversion to other land uses and by forest degradation. The mechanisms that cause deforestation, fragmentation and degradation are varied. They operate at multiple scales, for example internationally (e.g. markets and commodity prices) and nationally and/or locally (e.g. subsistence and poverty), and can be direct or indirect. Hence not all drivers are necessarily within the reach of national governments to tackle. Degradation lowers the resilience of forest ecosystems and makes it more difficult for them to cope with changing environmental conditions and to continue providing the services many people rely on.

i. Progress towards SFM has been improving over the last 25 years, with 99% of the world's forests covered by both policies and legislation supporting SFM, although policies may not necessarily

translate into action in the forest. Most countries offer opportunities for stakeholders to provide input to national policy processes – although with varying degrees of efficacy. Progress has been higher in the temperate areas and highly variable in the tropics where the capacity to utilize or enforce SFM policies, laws and regulations remains uneven. ITTO reported in 2011 that only about 10% of tropical forests are sustainably managed.

j. The area under forest management certification has continued to increase, from 18 million ha under internationally verified certification in 2000 to some 438 million ha in 2014. About 90% of the total area certified in 2014 is in the temperate and boreal zones.

8. Overall, the implications for biodiversity are mostly affected by the loss of primary forest (38 million ha since 1990), and the increase in plantation forest (currently 77.5 million ha more since 1990 and 7% of the total global forest), keeping in mind that 'assisted natural regeneration' is still counted as plantation forest. The calculation of forest area change, as a net change figure, also conceals the total amount of deforestation and forest expansion within countries, as well as improvements or degradation within the forest. There could be considerable losses at the national level which could be concealed by gains in relatively biodiversity-low forest regrowth as the FRA data does not disaggregate for gross loss. Therefore, addressing net area change proves a serious limitation for biodiversity.

9. Another observation relates to the analysis of the rate of change in natural forest area between 2010 and 2015 as an annual average. A majority of countries demonstrate high rates of natural forest area loss. Regardless of countries' forest cover, such representation gives equal weight to countries, making small losses in absolute terms in low forest cover countries stand out. Since implementation is at the national scale, a disaggregation of the rates of natural forest loss could prove useful to highlight where national efforts require further efforts to reverse the trend of loss and where more support may be needed.

10. Other implications from FRA 2015 include the growth of protected area by 150 million ha to 13% of the global forest area. Such increase, while clearly important, is nevertheless minimal as compared to the loss of forest area. The findings are also challenged by other datasets and scientific research. While such datasets use different definitions of forest and methodologies to track forest as land cover data, contrary to FRA's focus in monitoring forests as land use, and so different figures are bound to result. Nevertheless, a variety of datasets should be considered to complement information and help provide accountability and transparency in information. Further work may be called for to enhance data on biodiversity in FRA reporting to contribute to global policy setting bodies such as the CBD, CITES, CMS, among others.

11. In addition there is concern that forest degradation is not well-reported by the FRA (nor in any other data, for that matter). Better data for forest degradation based on a firm definition and data products derived by FAO, such as one for primary forest, for example, would be beneficial in providing a global picture of the state of forest resources. However, as such data depends mainly on individual country reporting, the data collection and verification process of FRA requires the strong engagement of national institutions in all countries, and inevitably, needs to address data shortages and inconsistencies often as a result of lack of national capacity.

12. Data from the FRA can be used to provide information for monitoring progress on Aichi Targets 1, 4, 5, 7, 9, 11, 14, 15, and 18. Further work with FAO in analyzing compiled data for all countries can especially help depict a better understanding of the extent of progress being made to reduce the rate of loss of natural forests, for reporting at regional and global levels, and to assess factors contributing to a rate of gain in natural forest area.

13. Additional data on global forest cover is provided in the Global Forest Change[6] (GFC) database, that uses satellite imagery and a 30% forest cover definition to provide data globally and nationally. For example, it reports

[6] The Global Forest Change dataset is a high-resolution dataset characterizing forest extent and change. Trees are defined as vegetation taller than 5m 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

global forest loss of 2.3 million square kilometers and gain of 0.8 million square kilometers from 2000 to 2012 at a spatial resolution of 30 meters, but considers a forest fire as loss and plantation as gain and so differs from the FRA data. Additional information on the use of FRA data, and other data sources, like the GFC dataset to measure progress towards the forest-related Aichi Targets, in particular Targets 5 and 15, can be found in UNEP/CBD/ SBSTTA/20/ INF/38.

B. The State of the World's Forest Genetic Resources 2014 (FAO)

14. Forests provide food, goods and services that are crucial to the survival and well-being of all humanity. These benefits rely on safeguarding the world's forest genetic diversity, which according to the 2014 Report on the State of the World's Forest Genetic Resources, is increasingly at risk. In fact, half of the forest species reported as regularly utilized by countries are threatened by the conversion of forests to pastures and farmland, overexploitation, and the impacts of climate change.

15. As genetic diversity is the mainstay of biological stability, it enables species to adapt to changing environments, including to the effects of climate change and emerging diseases. It is also the basis for present and future selection and breeding programmes. The State of the World's Forest Genetic Resources 2014 summarizes information available on genetic resources in forests, helping to highlight the need to improve data gathering and research to promote the conservation and sustainable management of the world's forest genetic resources, as well as access to information and knowledge in this regard. The report provides a series of indicators that can be used to address trends of change and proposes a number of ways forward to develop better information on, and to protect, forest genetic resources.

16. Of particular relevance to biodiversity the report underlines that:

a. Many tree species have yet to have any information developed on their genes – probably fewer than 1% and genomic knowledge for trees is far behind that for many other taxa.
b. Half of the forest species reported are threatened, with the proportion as high as 45% in North America and little to no research is available to understand their genetic materials.
c. Very few distribution maps are available.
d. Most species are conserved in situ, while ex situ collections are limited to some economically valuable species.
e. Breeding programs have been and are being used to enhance species' responses to climate change.

17. Moreover, loss of forest cover and loss of primary forests, especially in the tropics, the use of exotic species in plantations, invasive species and the loss of ecosystem types (e.g., <5% of Brazil Atlantic forest remains) are among key issues affecting forest genetic resources. Many species are faced with extinction, with cases of threatened species, such as: 159 out of 192 palm species on Madagascar, 60% of 762 trees of Mexican cloud forests, and 261 woody species listed in India. Further, there is continued loss of intra-specific genetic diversity, which has consequences for management and for response under climate change.

18. In addition to their irreplaceable contribution to environmental sustainability, forest genetic resources provide a direct food source for humans and animals, even at times when annual crops fail. Genetic diversity is needed in order to ensure that forest trees can survive, adapt and evolve under changing environmental conditions. It also maintains the vitality of forests and provides, in part, the resilience to stresses such as disturbances, pests and diseases.

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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

19. In many countries, prospects for sustainable development in rural areas will be greatly influenced by the state of diversity in forest ecosystems and species. Conserving forest genetic resources is vital as they are unique and irreplaceable resources for the future.

20. Several courses of action are recommended by the Report to improve data and protect genetic resources, including by strengthening national programs; establishing regional forest genetic resource systems; improving in situ and ex situ conservation of forest genetic resources; improving management by promoting restoration with appropriate genetic material, proper management for climate change and increased research; and improving the policy environment through the use of national strategies and coordination among agencies, regional research programs, better education. As the only global summary on forest genetic resources, the report provides an essential resource for the genetic component of tree genetics as a part of biodiversity. Data are provided that can help assess Aichi Targets 5, 9, 12 and 13.

C. The Global Plan of Action on Forest Genetic Resources (FAO)

21. The Global Plan of Action on Forest Genetic Resources is a voluntary and non-binding tool, which reiterates many of the points developed in the State of the World's Forest Genetic Resources. The Plan of Action is designed to improve knowledge and management of forest genetic resources, with the main knowledge gaps focused on a lack of: an updated species checklist in many countries an accurate global picture of the status and trends of forest genetic resources; a comprehensive assessment of national and international capacities to manage forest genetic resources; an accepted methodology for directly linking general information on changes in forests to their impacts on biological diversity, species, populations and genetic variation; and the knowledge of the reproductive and development characteristics of forests species that would allow for effective ex situ conservation, production of seedlings, planting and development of such species outside their original habitats.

22. The document suggests actions that can be undertaken among several main focal areas including knowledge, management and policy improvement. If instituted, the Global Plan of Action could contribute considerably towards Aichi Targets 5, 7, 9, 12, 13 and 15.

D. The 2014 State of the World's Forests

23. The 2014 edition of FAO's State of the World's Forests brings together analyses and data about the socioeconomic benefits of forests, defined by FAO as the basic human needs and improvements in quality of life that are satisfied by the consumption of goods and services from forests and trees, or are supported indirectly by income and employment in the forest sector.

24. Statistics related to forest use by humans include references to the formal forest sector employing nearly 13.2 million people across the world and at least another 41 million employed in the informal sector. The availability of data on forest benefits and gender is limited at the national, regional and global levels, and mainly concerns employment. Therefore the report focused primarily on the distribution of employment-related benefits between men and women. For activities in the informal sector, the report analyzed the gender dimension of woodfuel collection, due to a lack of data for other activities. It also indicates that forest products make a significant contribution to the shelter of at least 1.3 billion people, or 18 percent of the world's population and that about 2.4 billion people cook with woodfuel (about 40% of the population of less developed countries). It also suggests that 764 million of these people may be boiling their water with wood.

25. From a biodiversity point of view, the document, however, does not address impacts to biodiversity or the role it plays to ensure socio-economic benefits. In some contexts, it depicts biodiversity as a limitation rather than a contributor of healthy and productive forests. Among the key messages drawn from the report, there is minor recognition to the value of forest services, such as erosion protection and pollination, as essential to sound decision-making. Biodiversity is portrayed in the report, as a forest commodity, along with water and wood.

26. The report illustrates that biodiversity is not mainstreamed to the extent that it should be. There is lack of recognition that biodiversity underpins most ecosystem goods and services, from which humans derive economic benefits. Apart from the limitations in presenting the linkages between biodiversity to ecosystem services, the report could provide a better set of figures on human direct and indirect dependency on forests, and could tangentially contribute to Aichi Target 14 and 19. The analysis of socioeconomic benefits received by indigenous people is constrained by the same difficulties of data availability noted for gender. While numerous studies about the use of forests by indigenous people in specific localities are available, information about the benefits that they receive is rarely collected systematically at the national level. Further reports could ensure more comprehensive coverage on livelihood and governance aspects, for example, depicting aspects of gender, the role of women in forest conservation and restoration, and their rights, needs and aspirations in forest-related policies.

III. FINDINGS FROM GBO-4 AND RELATED ASSESSMENTS

A. Context and challenge

27. GBO4 was published at the halfway point towards the 2020 deadline for most of the Aichi Biodiversity Targets and is therefore a useful source for reviewing progress towards the goals of the Strategic Plan for Biodiversity, and for assessing further action governments may need to take to achieve the targets which were collectively committed to in 2010. A suite of questions are raised by GBO4 relating to the achievement of the Strategic Plan including available pathways towards the 2050 Vision for Biodiversity and its relevance to the 2030 Agenda for Sustainable Development.

28. Forest cover a large part of the world's surface and their multi-functionality concern millions of people. They are a necessity to everyday life and, in many ways, vital for human survival and well-being. They play an important role at the global, regional and local levels by providing a wide variety of goods for medicinal, cultural and spiritual purposes, helping to moderate the soil, regulating water flow and rainfall critical to grow food, storing and purifying drinking water, regulating temperature, sequestering carbon and reducing greenhouse gas emissions, mitigating climate change, lessening the impacts from natural disasters, such as droughts and floods, and providing other resources such as fuel, fiber and food.

29. Forests harbour two thirds of all terrestrial animal and plant species. Components derived from forest species are often found in numerous commercially-traded products, ranging from pharmaceuticals, home good products, to timber and clothing. The health of forests and the provision of these and other forest ecosystem services depend on the diversity between species, the genetic diversity within species, and the diversity of forest types. Their role in achieving the Aichi Targets is both direct and indirect. For example, policies to increase natural forest cover through restoration and reforestation and to expand and or designate new forest protected areas, if well planned and implemented, can contribute to the advancement of Aichi Targets 5, 11 and 15. Moreover, efforts taken to integrate forest conservation policies into broader national and local development programmes, as part of Target 2, could also be indirectly contributing to the long-term success of these actions.

30. Globally, rates of deforestation are declining but are still alarmingly high and are increasing in most tropical areas. For instance, considerable gain in forest area has also been reported in some areas, for example in China and Vietnam, while the rate of deforestation in Central America is declining Despite this, deforestation in many other tropical areas of the world is still increasing. High rates of decline for global wetland area have also been reported although no globally-agreed measure exists for the extent of coastal and freshwater wetlands. GBO4 reveals that the total area of land remaining in natural or semi-natural conditions has dipped in recent decades and may further decline by 2020 if recent trends continue. Further, coastal habitats such as mangroves continue to be lost as a result of activities such as aquaculture, land reclamation and urban development.

31. Expanding areas under agriculture and pasture are occurring, often at the expense of forests. Such expansion is mainly due to an increase in human population and subsequent growing demand for food. Large scale agricultural expansion is the main land use driver of deforestation and land degradation over the past several

decades. Its impact has been particularly severe in tropical forest regions, where pasture and crop land is expected to continue to increase over the next 30 to 50 years.[7] For example, in Rwanda, remnant forests such as the Karama savannah forest and many others across the country have been under high human pressure and degraded due to agriculture expansion, trees cutting for firewood collection, charcoal production, poles and timbers production.

32. Based on business as usual scenarios, consumption and production of wood resources are expected to further increase to meet the rise in global population and wealth. Specifically, wood consumption is expected to increase 1.3 times, with total forested areas decreasing 1.5 million square kilometers from 2010 to 2050.[8] In 1990 annual wood removals amounted to 2.8 billion m3, of which 41 percent was for woodfuel, while in 2011 annual wood removals amounted to 3.0 billion m3, of which 49 percent was for woodfuel.[9] Trends in wood consumption and production combine to negatively affect progress towards forest habitat protection and sustainable livelihoods. The loss of habitat and degraded ecosystem services will also impact forestry in ways, such as incurring costs and requiring future changes to their operations. Clearly the correlation between Targets 4, 5, 7, 14, 18 and 20 are significant and negative impacts on Targets 5 and 14 can trigger severe social, economic and ecological losses.

33. Current consumption patterns of wood resources could continue to push ecosystems, such as forests, beyond safe ecological limits. This will threaten the livelihoods of more than 2.4 billion people that depend on forests, to varying degrees, including for woodfuel, medicinal plants and forest foods. Those who rely on forests for their livelihoods are among the poorest people on the planet, and they are disproportionately female that depend on forest resources for their subsistence.

34. Women constitute about 70 percent of the 2.8 billion people living on less than US$2 per day. Over the past few decades, many forest-dependent people, particularly women, have faced emerging challenges due to the adverse impacts of climate change and increasing encroachment over forest areas. This has not only affected rural households' overall food security and livelihoods, but also women's income-generating opportunities, as well as work burden and safety; for instance, by forcing women to walk longer distances and deeper into the forests to collect woodfuel and NWFPs.[10]Many households in developing countries, especially in Asia, derive as much as 50 to 80 percent of their annual household income from NTFPs. Well managed wood and non-wood products could also be used to replace competing products and materials which are less sustainable from a climate point of view. There are examples of sustainable forest management practices indicating that the production of wood and non-wood products can actually be increased without pushing forests beyond safe ecological limits.

35. The ecosystem services that forests provide are of particular importance for the poor and vulnerable, for example as a source of non-timber forest products (NTFPs) such as food, freshwater provision, fibre and medicine, directly related to elements of Target 14. The production and trade of non-timber forest products (NTFP) has also been extending to more remote areas. However, NTFPs do not have large and reliable markets, and the few that do are likely to be supplied by specialized producers using more intensive production systems. While, many NTFPs are indispensable to poor communities, their potential for commercialization is limited.[11]

36. Products such as nuts, fruits, seeds, ropes, dye, lianas, gum, wax, honey, wild animals, among other, constitute a large resource of food, medicine and commerce but unplanned and uncontrolled harvesting, due to human pressure, has degraded the resource to a less productive level. Moreover, most of the expanding local trade

[7] (MEA) Millennium Ecosystem Assessment. 2005. Ecosystems and Human Well-Being: Policy Responses. Volume3, Ch8. Island Press, Washington, DC.
[8] PBL (2012). *Roads from RIO+20 Pathways to achieve global sustainability goals by 2050*. The Hague: PBL Netherlands Environmental Assessment Agency.
[9] FAO, FRA 2015.
10 FAO and RECOFTC. (2015) Mainstreaming gender into forest policies in Asia and the Pacific. Accessed at: http://www.recoftc.org/reports/mainstreaming-gender-forest-policies-asia-and-pacific
11 (MEA) Millennium Ecosystem Assessment. 2005. Ecosystems and Human Well-Being: Policy Responses.Volume3,Ch8. Island Press, Washington, DC.

in traditional medicine, fibers, bushmeat and other domestic needs are not from domesticating the raw materials, but rather continuously being sourced from the wild, thereby reducing population density of the species and causing near extinction of many species.

37. Efforts to improve sustainable forest management in many countries are challenged by illegal and/or unsustainable logging, harvesting of forest products and other illegal activities. The loss to governments, mainly in developing countries, from uncollected taxes and royalties could reach US$15 billion a year. Some estimates indicate that close to 15% of internationally traded roundwood might originate from illegal sources.[12] Rare tree species and those with high value for timber or non-timber forest products are often in danger of becoming locally extinct.[13]

38. Illegal settlements following construction of new forest access roads to previously inaccessible regions are also a significant threat to forest biodiversity. Together with land grabs, illegal settlements are linked to elevated rates of tropical deforestation in Southeast Asia.[14] The impact to land clearings and the conversion to rubber plantations, as well as oil palm plantations and other agricultural commodities, for example, requires further attention. Myanmar, for example, has reported that the major drivers of deforestation are increased population, high demand for timber and woodfuel, agricultural expansion, urbanization, and development of infrastructure such as dams, reservoirs, and roads. In Vietnam, the construction of new roads as part of the national development process has also provided easier access for the transportation of timber, which has led to an increase in illegal wildlife hunting and exploitation of non-timber forest products, including transboundary hunting. This has resulted in additional pressure on wild fauna and flora, already severely affected by habitat degradation and fragmentation.

39. Due to habitat loss from expanding agriculture, livestock production and forestry, there are particularly strong declines predicted, under a business-as-usual scenario, for several taxonomic groups in Africa and Central Asia, though projected changes vary substantially depending on the trajectory taken.[15] Tropical moist forests are home to the largest number of threatened species of any biome. Assessments indicate that numerous, but not yet scientifically described, species are being lost together with their tropical forest habitats.

40. Forested wetlands, particularly peat lands, represent a particularly vulnerable forest type. These are one of the most globally important terrestrial carbon sinks, but if destroyed, they will become the largest single carbon source of global significance. As highly biodiversity-rich ecosystems, they provide significant ecosystem services, and furnish an important food source to many communities, underpinning productive sectors, like fisheries. They also serve, in some cases, as natural buffers against storms and sea surges.

41. A considerable proportion of Ramsar Sites include forested areas, although a lack of data constrains estimates of the extent of coverage of this forest type under existing protected area systems. Not only are forested wetlands vulnerable to excessive direct use, but also to the added threat of unsustainable water use, in particular from agricultural activities. For example, in Indonesia, 116,000 fires broke out in peatlands in 2015. The extensive fires were extremely difficult to extinguish because the water tables had been drained by nearby plantations. In this sense, large-scale industrial agriculture can undermine the resilience of natural ecosystems against threats such as drought and fire. With indications that the threat levels to vulnerable ecosystems are likely to increase for Target 10, the forestry sector could play an important role to mitigate such threats. Stabilizing soils

12 Brack et al. 2002, Contreras-Hermosilla et al. 2007
13 FAO 2006b, IUCN 2004
14 Hall, R. et al. J. Peasant Stud. 42, 466–87 (2015). . Miettinen, J., Shi, C. & Liew. S. Glob. Change Biol. 17, 2261–2270 (2011).
15 Leadley, et al. (2014). Interacting regional-scale regime shifts for biodiversity and ecosystem services, *BioScience*, 64 (8):665-679.

by keeping riparian watersheds forested and maintaining estuarine habitats, including mangroves and marshlands, as well as using less fertilizer, are some ways forests can be a part of the solution.[16]

42. The impact on Indigenous Peoples and Local Communities, and on the livelihoods of other forest dwellers, is also shown to vary. In some cases forest management practices have competed with communities for access to a limited resource base, displacing communities and /or disregarding cultural or spiritual sites and practices. But, cases also highlight the role of Indigenous Peoples in small-scale forestry operations, extracting wood mostly for local use and domestic markets. In this regard, Technical Series 79 calls attention to the way intermediaries, traders and middlemen, who buy, process and/or sell wood-based products, tend to indirectly influence production practices, thus impacting biodiversity, through the influence on producer's prices and margins.

43. Findings from GBO4 and its underlying technical reports, note that a combination of policy, legal, technical, spatial planning and financial measures are required to effectively counter deforestation, fragmentation, degradation, and species loss, at appropriate scales. Scenarios reveal that there are plausible pathways to achieve the 2050 vision to end biodiversity loss, while meeting broader development goals. Such efforts include limiting climate change to two degrees Celsius warming and pursuing efforts to limit it to 1.5 degrees Celsius, combating desertification and land degradation. Sustainably managing forests can be a driver to these objectives by protecting, restoring and promoting the sustainable use of terrestrial ecosystems.

B. Links among the Aichi Biodiversity Targets and other processes

44. GBO4 indicates that some progress has been made towards certain components of the forest-related Aichi Targets, including: increasing public awareness (Target 1); integrating biodiversity values into national and local strategies (Target 2); developing positive incentive measures (Target 3); developing sustainable use plans, through corporate standards (Target 4); decreasing deforestation rates (Target 5); increasing areas under sustainable forest management (Target 7); identifying invasive alien species and their pathways for infection (Target 9); increasing terrestrial protected areas and their effective and equitable management (Target 11); mobilizing attention on restoring degraded terrestrial ecosystems (Target 15); increasing effective participation of indigenous people and local communities (Target 18); sharing science based knowledge and technologies on forest biodiversity (Target 19); and mobilizing financial resources (Target 20). However, projections indicate that current efforts are not enough to reach the Targets by 2020. Despite ambitious restoration and conservation efforts, there is still a net loss of forests, a major global carbon stock, suggesting no overall progress on a key element of Target 15.

45. Reducing deforestation rates have been estimated to result in an annual benefit of US$183 billion in the form of ecosystem services.[17] The State of the World's Forests report found that, out of 41 Poverty Reduction Strategy Papers produced between 2007 and 2013, there were 37 that incorporated forests, signifying that countries are acknowledging the role of forests in contributing to poverty reduction.[18]

46. Underlying poverty drives unsustainable or weak forest management, illegal harvesting and lack of investment in forest management. Lack of secured tenure patterns also promotes short-term and unplanned maximization of production rather than long-term sustainable management. Maximizing the synergies between forest biodiversity conservation and sustainable use with goals related to sustainable development, demonstrating

[16] Kennedy E. V., C. T. Perry, P. R. Halloran, R. Iglesias-Prieto, C. H. Schonberg, M. Wisshak, A. U. Form, J. P. Carricart-Ganivet, M. Fine, C. M. Eakin, and Mumby, P. J. (2013). Avoiding coral reef functional collapse requires local and global action. *Current Biology* 23:912-918.

[17] HLP2 (2014). High-Level Panel on Global Assessment of Resources for Implementing the Strategic Plan for Biodiversity 2011-2020 (phase 2).

[18] FAO. (2014). State of the World's Forests Enhancing the socioeconomic benefits from forests. Available at: http://www.fao.org/3/cf470fab-cc3c-4a50-b124-16a306ee11a6/i3710e.pdf

options to forge compatibility, could aid in the maintenance of ecosystem services and provide a route out of poverty for many.

47. With secure tenure rights, Indigenous Peoples' territories and other community conserved areas can play an effective role to reduce deforestation. The links between Targets 5, 14 and 18 reveal the importance of public policies that respect and strengthen the rights of forest communities over their land to not only decrease greenhouse gas emissions from deforestation, caused by commercial agriculture and mineral extraction, but also to prevent biodiversity loss and encroachments from illegal settlers and loggers.

48. On the contrary, traditional territories could face serious pressures from high commercial demand for land. The loss of access to land is especially detrimental to the subsistence of pastoralists and people that dependent on forest resources, in particular women. As such, Target 14 and 18 can be regarded as enabling Targets for the achievement of the other targets, and these are highly dependent on other targets and actions in other policy areas.

49. Many underlying drivers of deforestation are beyond the control of the forest sector and national forest policies, legislation and programmes individually. Indirect land use change, also referred to as 'leakage', may occur through the migration of agents of deforestation to neighbouring locations or though trade in timber or agricultural products. Unsustainable production and management practices in timber extraction and logging, and other pressures on forest resources, such as gathering of firewood, can lead to forest degradation and permanent losses in biodiversity. This shows the strong correlations between Targets 4, 5, 7, 14 and 15.

50. Globally, over half of the temperate broadleaf and mixed forest biome and nearly one quarter of the tropical rain forest biome have been fragmented or removed by humans.[19] Forest fragmentation drastically alters species distribution and presence and impacts the ecological interactions among species.[20] Fragmentation negatively impacts bird species, particularly in tropical regions which can have implications on biotic processes because of their role as seed dispersers, pollinators, and insect herbivore.[21]Forest fragmentation can have negative implications for progress towards Aichi Targets 5, 11, 12, 14 and 15.

51. In many countries increased unregulated hunting continues to be a major threat to forest biodiversity. The depletion of wildlife is closely linked to the food security and livelihood of numerous tropical forest-region dwellers, as many forest-dependent people have few alternative sources of protein and income. Unsustainable hunting pressures are also often linked to logging activities.[22] Many of the underlying causes of unsustainable use of wildlife are the same as those underlying poverty. Greater attention must, therefore, be given to governance issues (e.g. policy and legislation, links to development assistance) and treating the high-value wildlife trade as an aspect of the national economy. Achievement of Target 12 is therefore highly dependent on most of the other Aichi Biodiversity Targets. As such, Target 7, related to forest management, among other management practices and activities, has an important role to play.

52. At a national scale, the Instituto Nacional de Pesquisas Espaciais (INPE) in Brazil, for example, reports that the free availability of near real-time imagery of the Amazon forest has led to increased awareness of and participation by stakeholders in the conservation and sustainable management of forests, as well as in the

19 SCBD. 2008. Subsidiary Body on Scientific, Technical and Technological Advice (13/3). In-depth review of the expanded programme of work for forest biological diversity. Accessed at: http://www.cbd.int/doc/meetings/sbstta/sbstta-13/official/sbstta-13-03-en.pdf

20 Magrach, A., Laurance, W. F., Larrinaga, A. R., & Santamaria, L. (2014). Meta Analysis of the Effects of Forest Fragmentation on Interspecific Interactions. Conservation Biology, 28(5), 1342-1348.

21 Bregman, T. P., Sekercioglu, C. H., & Tobias, J. A. (2014). Global patterns and predictors of bird species responses to forest fragmentation: Implications for ecosystem function and conservation. Biological Conservation, 169, 372-383.

22 Nasi, R., D. Brown, D. Wilkie, E. Bennett, C. Tutin, G. van Tol, and T. Christophersen. 2008. Conservation and use of wildlife-based resources: the bushmeat crisis. Secretariat of the Convention on Biological Diversity, Montreal, and Center for International Forestry Research (CIFOR), Bogor. Technical Series no.33, 50 pages.

compliance of forest legislation. However, to meet all components of the Target 19, further efforts are needed on investment in data mobilization and capacity building related to Target 20 and coordination of models and technologies that can be readily transferred and applied in decision making.

53. Market-based responses, like payments for ecosystem services, are working to redistribute rights to stakeholders, in an effort to enhance their roles in securing wood supplies and other ecosystem services. Market approaches to allocate user rights to public lands, and voluntary certification, are also helping to change the structure of wood industries. But, the existence of policies, legislation and regulation is not always coupled with effective incentives or enforcement. Step-wise incentives are therefore needed to encourage wood producers to enhance existing capacity, to cover transaction costs, and improve forest management practices.

54. Other responses, including legal action and enforcement, are needed to turn away from negative forestry practices. In the light of growing international commitment to reduce greenhouse gas emissions from deforestation, under the United Nations Framework Convention on Climate Change (UNFCCC), policy approaches and positive incentives are being used for activities that contribute to REDD. Political institutional (e.g. enforcement mechanisms) and economic conditions crucial for the success of REDD vary from country to country, and these are only starting to become operational. Trends indicate that the scope of REDD programmes are transcending deforestation and forest degradation, and including efforts to address the "plus", through the conservation of forests, sustainable forest management and forest carbon stock enhancement. REDD+ activities can contribute to several Aichi Targets, including Targets 3, 5, 7, 11, 14, 15, and 18.

55. Community forests also represent a vital opportunity to help mitigate climate change, while offering important contributions to the conservation and sustainable use of forest biodiversity, including through community-based monitoring, ecosystem management, raising the attention of severe threats, and more. Studies show that communities have legal or official rights to about one eighth of the world's total forests (nearly 513 million hectares of forests) comprising 37.7 billion tonnes of carbon. This means that a considerable size of global forests with legal recognition and government protection of community forest rights could play a role in maintaining and protecting healthy forests.[23] For example, Brazil's indigenous territories demonstrate that legal recognition and government protection have helped Indigenous Peoples and Local Communities to challenge deforestation pressures and maintain healthy forests. In this case, rates of deforestation showed that they were 11 times lower in community forests with strong legal recognition and government protection than in other forest areas of the Brazilian Amazon.

56. Related to Target 9, the number of invasive alien species continues to increase globally at an unprecedented rate, as do their impacts on biodiversity. For example, forests in North America have been negatively impacted by invasive alien species. Cases of chestnut blight, Dutch elm disease, gypsy moth, emerald ash borer, and others, have impacted forests to such an extent that major elements of the forest biome have now disappeared, or have been drastically reduced from historical levels of ecosystem presence and function.[24] Though success is severely limited, it is encouraging that more than half of the Parties to the CBD have national policies, linked to Target 17, relevant to tackling invasive species and local communities have also undertaken efforts to integrate eradication of invasive alien species with stewardship of forests.[25] This implies that the degree of development of IAS-specific regulation and policies is a useful indicator of progress towards IAS control targets.

23 Stevens, C., R. Winterbottom, J. Springer, and K. Reytar. 2014. "Securing Rights, Combating Climate Change: How Strengthening Community Forest Rights Mitigates Climate Change." Washington, DC: World Resources Institute. Accessible at www.wri.org/securing-rights.

24 Poland T. M., and Mccullough, D. G. (2005). Emerald Ash Borer: Invasion of the Urban Forest and the Threat to North America ' s Ash Resource 1990.

[25] Kothari A., C. Corrigan, H. Jonas, A. Neumann, Shrumm, and Holly. 2012. Recognising and supporting territories and areas conserved by Indigenous Peoples and Local Communities: Global Overview and National Case Studies. Page 160. Montreal, Canada.

57. Protected area networks and their effective management have long been an important form of forest conservation, with direct impacts on forest biodiversity. Comparisons of several development trajectories suggest that, while increasing coverage of protected areas to 20 percent has modest but important effects on reducing biodiversity loss (similar in magnitude to reducing deforestation to low levels or strongly limiting use of biofuels), they remain smaller than the effects of changing dietary consumption patterns or reducing agricultural waste.[26] Hence, there is a clear imperative to manage forest biodiversity on multiple fronts beyond protected area networks indicating strong linkages between the area base Targets 5, 7, 11 and 15. Further research and applicability of technology, as related to Target 19, is also needed as it is often unclear how effective the protection of these areas networks are, and different forest types are represented very unequally in the total area of protected forests. Moreover, research also shows that Indigenous Peoples' territories and other community conserved areas, with secure tenure rights, can be effective in managing protected areas.

58. Conserving forest genetic resources is vital and can impact ecosystem functions, numerous ecosystem services and higher levels of biodiversity. Genetic diversity within forest species is vulnerable to fragmentation, disruption of plant pollinator interactions, overexploitations of resources, increasing invasion of alien plant species, climate change and more. The 2014 State of the World's Forest Genetic Resources and the Global Plan of Action on Forest Genetic Resources can assist countries to integrate forest genetic resource conservation and management needs into their national policies and frameworks.[27] Progress in this regard will benefit from an increase in scientific knowledge and development to monitor the conservation efforts for forest genetic resources. Efforts under Target 15 also offer huge potential for contributing to the conservation of forest genetic resources through effectively designed and implemented restoration activities and practices in forest biomes.

59. Although reforestation and conservation efforts are underway for some depleted forest biomes, there still remains a net loss of forests, highlighting the interconnectedness between Targets 5, 11 and 15.[28] Close to a third of the NBSAPs reviewed contain national targets specifically aiming to halt national habitat loss, including forests, and restore 15 percent of degraded lands. The challenge is to clarify what is interpreted by degraded lands and the extent to which planned actions address the restoration of degraded ecosystems, using methodologies that prioritize the ecosystems to be restored, the area involved and a reference period.

60. From a biodiversity perspective, restoration is not a perfect remedy to natural habitat loss and the mitigation hierarchy (avoid, mitigate, compensate) should be strictly applied. Biodiversity loss is one direction and restored ecosystems take very long periods of time to regain their full ecological functioning (and perhaps never do). It is therefore important to consider Targets 5 and 15 in parallel and avoid reporting that would conflate the two (e.g. "net deforestation"). Separate time-bound targets are needed for reductions in the clearing of native forests (i.e. gross deforestation) and increases in the establishment of new forests on previously cleared lands (i.e. reforestation). Net deforestation targets can be misunderstood to equate the value of protecting native forests with that of planting new ones, and care must be taken when advocating biodiversity offsets in this regard.

61. Restoration projects addressing carbon services are being triggered by the rise of policy approaches and positive incentives such as REDD+, as well as processes and initiatives, such as the Bonn Challenge, the NY Declaration on Forests, the Asia-Pacific Rainforest Recovery Plan, the 20x20 Initiative for Latin America and the Caribbean and the African Resilience Landscapes Initiative. Further coordination with global and regional initiatives, including the Forest Ecosystem Restoration Initiative, the Forest Landscape Restoration Mechanism, the ITTO/CBD Collaborative Initiative on Tropical Forest Biodiversity and other initiatives under the Global Partnership on Forest Landscape Restoration could be sought.

[26] Leadley, *Progress towards the Aichi Biodiversity Targets*, 268.
[27] FAO. (2014). Global Plan of Action on forest genetic resources. FAO. Available at: http://www.fao.org/3/a-i3849e.pdf
[28] (SCBD) Secretariat of the Convention on Biological Diversity. 2014. Global Biodiversity Outlook 4. Available at: https://www.cbd.int/gbo4

62. UNEP/CBD/SBSTTA/20/INF/38 provides an analysis of Aichi Biodiversity Targets 5 and 15, including an analysis of these processes and initiatives that are promoting forest and landscape restoration actions in the context of climate change and the increasing ambition of the restoration pledges made by countries, sub-national government (e.g. states) and the private sector. Considering the current loss of tropical forests and the benefits that progress in Target 15 can have on other forest-related Aichi Targets, such as Target 5, 7, 11 and 14, tropical forest ecosystem restoration is considered a high priority in achieving the Strategic Plan.

63. Many international organizations, including members of the Collaborative Partnership on Forests (CPF), have been improving their individual and collective contributions to support elements of the Aichi Biodiversity Targets.[29] Partner organizations have been working to generate new sources of knowledge, including for monitoring aspects of biodiversity and ecosystem services, the consequences of its loss and more.[30] For example, the elements of the Durban Declaration, from the XIV World Forestry Congress, promote the need for a deeper understanding of the integral role of biodiversity for forest ecosystem functioning. Moreover, the ECOSOC resolution 2015/33 acknowledges different visions, approaches, models and tools of sustainable forest management, which address biodiversity conservation, sustainable use and management in different ways. In recognition of the need to enhance coherence, cooperation and synergies among forest-related agreements, and their processes and initiatives, partner organizations of the CPF could ensure better alignment of forest-related multilateral commitments and goals in the development of the Strategic Plan of the 2017-2030 international arrangement of forest and the work plan of the Partnership, taking into account recommendations from UNEP/CBD/SBSTTA/REC/XIX/8.

64. As most of the investment required to attain the Aichi Targets anticipates the delivery of multiple benefits, financing should be sought from joint funding. In this sense, there is a clear imperative for cross-sectoral integration to mobilize expanded financial resources for forest biodiversity. Bilateral agreements for the implementation of REDD+ programmes could potentially serve to demonstrate the multiple benefits of forests not only to mitigate greenhouse gas emissions, but also to secure forest resilience and community adaptation to a changing climate. This could support the recognition expressed on the importance of non-carbon benefits in the REDD+ context noted in the Paris Agreement adopted last December under the UNFCCC. In this regard, further attention could be targeted to the Cancun Safeguards that Parties to the UNFCCC COP have agreed to promote and support in REDD+ implementation, in particular "Safeguard E" on the conservation of natural forests and biological diversity. Further information on these opportunities can be found in UNEP/CBD/SBSTTA/ 20/INF/30.

IV. COMPREHENSIVE POLICY FRAMEWORKS

A. Additional information from fifth national reports

65. The findings from GBO-4 and associated assessments underlining the need to scale-up actions to mainstream biodiversity into forestry and other policy areas to ensure the sustainable use and conservation of forest biodiversity**.** Mainstreaming examples based on the submission of national reports to the CBD [31] are presented below.

1. Impact of extractive industries on forests

66. Illegal logging of forests due to increased population growth and the consequent demand for agricultural land, as well as, increased mining and the need for energy in rural and local communities were reported by a number of Parties. These underlying issues will continue to be factors of biodiversity loss in major terrestrial biomes. For example, India and Ethiopia both reported that increased consumption and agricultural expansion is leading to the loss of species and ecosystem services.

29 See UNEP/CBD/SBSTTA/19/INF/8
30 See UNEP/CBD/SBSTTA/19/INF/3
31 https://www.cbd.int/reports

67. In Belize, Viet Nam, Mozambique and Myanmar illegal logging of commercial timber species is responsible for the overexploitation of a variety of tree species, contributing to their extinction in the long term. Illegal logging within Belize has significantly increased, impacting an area of over 35,000 hectares, with losses of timber estimated at over $30 million. Logging roads provide entry points and increased accessibility to intact forests, increasing illegal hunting and harvesting activities. Cases of illegal poaching and species transport for illegal pet trade were also reported. Contractual agreements for Short Term Forest Licenses which offer few incentives for concession holders and limited human and financial resources to monitor concession areas could also be influencing unsustainable logging practices. As a result, Long-Term Forest Licenses for Forest Reserves are being designed to promote sustainable forest management and improve sustainable harvesting practices. The current revision of the National Forest Policy, National Forest Programme and the Forest Act is expected to strengthen Belize's management of its forest resources, including its biodiversity. Institutional weakness is one of the main causes of illegal extraction and biodiversity loss.

68. In Myanmar, enhanced logging regulations and an expansion of illegal wildlife markets in neighbouring countries have increased pressure on natural forests and biodiversity. Most documented seizures of illegal timber and wildlife trade have taken place close to, or in route to, international borders. Accordingly, Myanmar has started to develop an action plan for sustainable forest management and timber production. In Guyana, mining for example, has been recognized as the single largest driver of deforestation. The most degraded forest areas in Guyana are found in the North-West region of the country, which is known to have the highest concentration of mining concessions.[32] This area coincides with timber concessions, meaning that forestry could be providing infrastructure for mining.

69. The impacts of deforestation due to mining exploration in the Mukura and Gishwati natural reserves in Rwanda signal water related stressors, in which water flows have been reduced in the upper streams impacting lowlands to become dryer. The absence of forests has disrupted the water flow causing downstream water users to suffer water shortages. There is also a reduction in water quality because of the heavily cumulated soil sediments carried out from upstream by uncontrolled soil erosion. Forest degradation is also negatively impacting animal species richness and relative abundance due to the destruction of the natural habitat and an increase in poaching activities.

2. The need for integrated forest policy approaches

70. Cases of integrated policy approaches were reflected, for instance, in Mexico, the government has recognized the importance of mainstreaming biodiversity and forest objectives within various sectors in their National Development Plans. Of the 14 objectives in their 2007-2012 Plan, some included conserving ecosystems and biodiversity, slowing the deterioration of forests and integrating conservation and natural capital within economic and social development. Further work is needed, however, to address the issue of agricultural subsidies on deforestation, since subsidy programs such as PROCAMPO, which provides direct assistance to agriculture, may be influencing the clearing and burning of forests and thus triggering biodiversity loss.[33]

71. For many countries, integrated policy frameworks may be motivated by climate related and development aspirations. For example the Ethiopian Government has devised a Climate Resilient Green Economy (CRGE) Strategy based on four pillars, namely: agriculture, forestry, power and transport. Adoption of agricultural and land use efficiency measures, and protecting and rehabilitating forests for economic objectives and ecosystem services, have a direct links to biodiversity conservation and sustainable use. As part of its Strategy, REDD+ is used as a policy approach and positive incentive to promote forest and biodiversity conservation and enhance carbon stocks.

[32] WWF-Guianas Living Guianas Report, 2012 (from 5NR).
[33] OECD (2015), "Conservation and sustainable use of biodiversity", in OECD Environmental Performance Reviews: Brazil 2015, OECD Publishing, Paris.

72. In 2007, the German Government developed an agro-biodiversity strategy "Conservation of Agricultural Biodiversity, Development and Sustainable Use of its Potentials in Agriculture, Forestry and Fisheries". As a sectoral strategy, it supports and supplements the National Strategy on Biological Diversity. Its principal objectives are long-term conservation, broader use of genetic resources for the food sector and in agriculture, forestry and fisheries, and better reconciliation of the use and protection interests of biodiversity to halt the loss of biological diversity in Germany.

73. China noted the integration of biodiversity into land use planning at various levels. The National Master Plan for Land Use (2006-2020) issued by the State Council stresses the guiding principle of coordinating land use for production, livelihoods and conservation ecology. The Plan requires the protection of land essential for ecological processes and calls for greater efforts to enhance land ecology based on local conditions.

74. The Belize National Land Use Policy identifies fifteen strategies specifically included for effective land use planning for natural resources and conservation. These include the maintenance of key environmental services, maintaining the integrity of key watersheds, and sustainable supply of timber and non-timber resources, and of mangroves, in mitigating storm impacts and acting as nurseries for many economically important marine species.

75. In the eastern part of Rwanda, intense clearing of forest has led to changes in climate conditions, constraining agro-biodiversity as a result drought and pathogens to crops. Inversely, in the last decade, an intense reforestation initiative, and climate smart agriculture practices, aimed to restore vegetation has brought better climatic conditions (regular rain, increased soil humidity, etc.), favouring agriculture and livestock development, while reducing hunger and poverty in both regions. Socio-economically, these efforts have helped to ensure more diverse nutrition, enhance food production, raise incomes, cope with environmental constraints and sustainably manage ecosystems.

76. The Canadian Council of Forest Minister's Climate Change Task Force has developed a comprehensive, scalable, nationally applicable framework to assess forest and forest sector vulnerability and adaptation options. The techniques and information enables forest managers to evaluate climate change-related risks, vulnerabilities and opportunities to make informed decisions on the most beneficial adaptation measures. To assist in the uptake and application of these products, the Task Force has established a pan-Canadian Forestry Adaptation Community of Practice to allow forest managers, policymakers, consultants, and researchers to share best practices and lessons learned.

77. Cameroon's Forestry Policy Document was developed to ensure the conservation and management of the forest ecosystem and its resources, taking into account the needs of the population and the various sectoral interests including agriculture, livestock, mining and energy. Among its objective, the Policy Document aims to sustain and develop the economic, ecological and social functions of the forest through integrated management.

78. GEF projects are also promoting integrated approaches through community-driven sustainable land and ecosystem management at the landscape level. In India, for example, projects are contributing to mainstreaming land degradation concerns into national level policies, by integrating joint watershed and forest management with sustainable livelihoods development. The project aims to enhance the resilience of land and forest ecosystems and reduce the vulnerability of local communities to climate change.

79. In Australia, the Working on Country Programme is a highly successful, cross-cultural programme that started in 2007 in close collaboration with the Indigenous Protected Area (IPA) programme. Working on Country supports the aspirations of many Indigenous Peoples to care for land and sea country, providing opportunities for Indigenous Peoples to deliver environmental services that protect and sustainably manage Australia's natural and cultural assets. The Programme provides meaningful employment, training and career pathways for Indigenous Peoples and facilitates a partnership approach between Indigenous Peoples and Local Communities. Activities undertaken via the Programme include fire management, threatened species recovery projects, invasive animal

control and management of marine debris. By November 2015, there were 108 Indigenous Ranger groups in Australia delivering 775 full-time equivalent Indigenous Ranger positions. Around 80 per cent of Working on Country projects contribute to the protection of threatened species and over 90 per cent involve the transfer of traditional knowledge. Approximately 80 per cent of those employed by the programme are in remote areas.

3. Policy measures for sustainable forest management

80. Malaysia's Central Forest Spine Master Plan initiative ensures that key forest components harboring much of Peninsular Malaysia's biodiversity and ecosystem functioning are intact. In addition, the Heart of Borneo Initiative covering approximately 200,000 km2 of ecologically connected forests in Malaysia and Indonesia contributes to several Aichi Biodiversity Targets. The identification of High Conservation Value Forest (HCVF)[34] has profound implications on forest management options and is of critical importance in the formulation of forest management plans for the country.

81. In Belize the Forest Sector is revising its Forest Policy, with a focus on Long Term Forest Licenses to shift to 20-40 year timber concession agreements for Forest Reserves, based on long term sustainability, encouraging investment in replanting and effective management of timber stocks. These new agreements include conservation of biodiversity and strengthening biodiversity considerations within the extractive Forest Reserves of the National Protected Areas System.

82. The objective of Finland's 2015 National Forest Programme is to develop the forest sector into a bio-cluster that produces materials and services on an extensive basis for various sectors. The aim is to generate increased welfare by strengthening forest-based businesses and increasing the value of production, improving the profitability of forestry and strengthening forest biodiversity, environmental benefits, and welfare implications. In terms of biodiversity, the aim is to halt the decline of forest habitat types and species, and to establish a favourable trend in the state of biodiversity.

83. In Vietnam the agriculture and forestry sectors have integrated conservation and sustainable use into national laws, policies, and programs and into its national strategy. The "5 million Hectares Reforestation" Program, for example, had a budget of nearly US$2.5 billion over 12 years, to increase forest coverage to 43% by 2010, and, in addition, to conserve biodiversity, eradicate hunger, eliminate poverty and develop the national economy. The potential contribution of the Programme to elements of Targets 5, 7, 11 and 15 should be further explored.

84. In order to control deforestation and increase forest cover, Myanmar is strengthening its forest management practices, expanding the permanent forest estate, establishing forest plantations, developing community forestry, and strictly implementing the Myanmar Selection System. Achievements include an increase in the area of reserved forests and protected public forests from 22.75 % of the total land area in 2005, to 25.01 % in 2013. As Myanmar's Forest Policy targets aim to further expanse to 30% by 2030/31, it would be useful to identify what type of practices are being explored and how these contribute to Myanmar's biodiversity goals.

85. A vast majority of forest owners have Forest Management Plan (FMP) in Sweden. Commercially established FMPs include a detailed forest inventory including economic and environmental aspects, describing forest conditions, demonstrating environmental values in the forest, and listing planned management activities.

4. Supply chains and certification schemes

86. Certification of forest management can be an effective instrument for strengthening the conservation of biological diversity in forests and ensuring environmentally, socially and economically sustainable forest management through appropriate management measures. In Germany there are currently three certification

[34] High Conservation Value Forest (HCVF), as defined by the Forest Stewardship Council (FSC), is forest of outstanding and critical importance due to their high environmental, socio-economic, biodiversity or landscape values. The HCVF concept has received growing attention as a tool for promoting biodiversity conservation and complements the implementation of Sustainable Forest Management (SFM) practices.

systems that play a part in forest management: Programme for the Endorsement of Forest Certification Schemes (PEFC), Forest Stewardship Council (FSC) and "Naturland". At the end of 2011 close to 70% of Germany's forest area was certified under PEFC and about 5% under FSC (incl. approx. 0.5% Naturland). The total figure is close to its target figure of 80%. Germany also noted that the proportion of forest areas certified to high ecological standards (PEFC, FSC) has steadily grown.

87. The certification of forests and product chains in Brazil is carried out by several certifying agents, through two systems: (i) the Brazilian Forest Certification Programme (CERFLOR), connected to the PEFC, and (ii) FSC. CERFLOR grants certification according to the standards established by the Brazilian Association of Technical Standards. These Standards are integrated to the Brazilian Compliance Assessment System, which the National Metrology Institute manages. FSC, on the other hand, seeks to disseminate global standards on good practices in forest management that follow ecological and social sustainability safeguards, as well as economic viability criteria.

88. In Sweden forestry certification takes place within the FSC system and/or PEFC. More than 60% of forest areas are certified which allows the forestry sector to show that sustainable forest management to meet market demands is carried out sustainably. The major forestry companies are all certified and certain enterprises are double certified.

89. In Finland, forests are certified under market-based certification schemes PEFC and FSC. To date, approximately 500,000 hectares of forests have been certified under the FSC, predominantly by forest-based industry companies, as well as private forest owners under group certification of the companies. Additionally, approximately 20.7 million hectares of Finnish production forests are certified under the Finnish PEFC system.

5. Sustainable production and trade

90. Indonesia reported on the development of a Legal Wood Verification System (SVLK) to ensure that wood products and its material originate from legally managed sources. Wood is legal if the source of wood, logging permits, system and logging procedure, transportation, processing, and trade or transfer fulfill all legal requirements.

91. China is adopting compulsory conservation measures in "ecologically significant areas" to manage conservation and development objectives. In recent years 10% of the total area of protected areas has been set aside as "production areas", where local communities harvest bamboo, tea, among other, to develop ecologically friendly industries consuming less natural resources. Meanwhile measures have been taken to ensure that forests and biodiversity in 90% of the area will be effectively protected. This model has been recognized by UNESCO as a successful example of addressing conflicts between development and conservation in protected areas. China has also made improvements to avoid negative impacts on biodiversity and the environment by eliminating export subsidies on a number of highly energy-consuming, polluting and resource-consuming products, including products from endangered species, leather products, wood products and some disposal wood-made products.

92. Belize has granted 17 long-term concessions covering 224,600 ha. Concessions have been a subject of controversy in recent years between the Government and conservation groups. The increase in the number of concessions granted is a result of pressure for economic growth and globalization. Concerns stem on the granting of forest concessions over large areas as these may result in forest degradation or deforestation with serious impacts on Indigenous Peoples and Local Communities.

93. Guyana reported that forest concessionaires are required to obtain Environmental Authorization from the EPA and prepare Forest Management and Annual Operational Plans for their operations. Larger concessionaires are required to conduct Environmental and Social Impact Assessments and prepare Environmental Management Plans. Guyana has embraced the principles of reduced impact logging and has developed a Code of Practice for Timber Harvesting that outlines measures to be complied with by operators within the sector. All large concessions must allocate 4.5% of the total area to biodiversity conservation during the life of the concession.

This area must represent the various vegetation types found in that concession and all flora and fauna. No harvesting may take place within this area once approved for biodiversity conservation.

94. Other factors such as corruption and weak monitoring and compliance measures affect forest production and trade. In Nigeria, the collapse of logging controls is traced to corruption of forestry officials, affecting forests, their resources and other natural resource based products. Corrupt officials have aided in the deregulation of many biodiversity rich areas, for different reasons, thereby jeopardizing past efforts at conserving and sustainably using biodiversity.

6. Forest energy and alternative energy

95. The demand for new energy sources in Mozambique is growing. 80% of household energy consumed annually comes from biomass (firewood and charcoal). The country, however, is committed to promote the use and exploitation of renewable energy resources to reduce energy demand following the approval of the Development Policy of New and Renewable Energy.

96. In Nigeria approximately 70% of households mainly in rural and semi-urban areas depend largely on woodfuel consumption for their domestic and, to a large extent, commercial energy needs. The demand for firewood is higher in the less vegetated part of the country, as well as in urban cities where most poor unable to afford other costs of energy supply, use woodfuel for food production.

97. The majority of Ethiopia's energy needs are derived from woodfuel, crop residues and animal waste. Recognising that reliance on woodfuel and charcoal leads to widespread land degradation, soil erosion, gully formation and siltation, Ethiopia is currently investing on renewable energy sources, mainly hydroelectric plants to make electricity the main source of energy to alleviate the pressure on natural resources. A national improved cook stoves programme is being implemented by the Ministry of Water, Irrigation and Energy to support the dissemination of nine million improved energy saving cook stoves. This programme expects to save approximately 2.1 tons of woody biomass per year per household.

98. In Kenya, most rural and many urban dwellers depend on primary biomass energy sources for lighting and cooking. While woodfuel contributes to over 68% source of such energy, charcoal is the predominant energy source used by 13.3% of the population.

99. Woodfuel and charcoal cover about 80% of both Cameroon and the Democratic Republic of Congo's (DRC) energy needs. Due to DRC's rapid demographic growth, the country is looking to provide affordable alternatives to wood-energy. A cross-cutting energy policy integrating the wood-energy sector and its actors, along with a short, middle and long-term strategy is being developed.

100. In 2008 the European Union decided to substantially increase the proportion of biofuels in the automotive sector by 2020. The German Government however passed the Biofuels Sustainability Ordinance (Biokraft-NachV) in 2009, thereby transposing into national law the sustainability requirements of the Renewable Energy Directive 2009/28/EC for the production and energy use of liquid and gaseous biofuels. From January 2011 onwards, biofuels can only be credited against the biofuels quota and enjoy tax concessions if they comply with certain sustainability requirements: greenhouse gas saving of at least 35 percent compared with fossil fuels, including the entire production and supply chain; no destruction of land with high carbon content or of high nature conservation value; and cross-compliance requirements if grown within the European Union. Caution however should be placed in light of the impacts of bioenergy to biodiversity and the conversion of natural habitats, as most of the biomass to produce these biofuels will need to be imported in light of the magnitude of demand.

7. Financing/subsidies/incentives as they relate to forestry

101. Brazil highlighted the Forest Stipend, a pioneering and innovative initiative involving the payment for ecosystem services which has been rewarding and improving the quality of life of many traditional communities

that live in and off the forest of the Amazonas state and are committed to reducing deforestation. The Forest Stipend was the first internationally certified programme of its kind in Brazil and is one of the largest payments for environmental services (PES) programs in the world, reaching over 35,000 people in 15 state protected areas, a total area encompassing 10 million hectares of Amazonian forest. The Amazonas State Government, through its Environment and Sustainable Development Secretariat, established the program.

102. The Kenyan Government is in the process of creating conditions and incentives for effective conservation of biodiversity by local communities, by among other things, recognizing and affirming the value of local knowledge and local communities' rights to genetic resources and benefits from tourism in their areas. This is engraved in the recently enacted Intellectual Property Rights Act. This position will be enhanced when the country embraces and establishes mechanisms for determining sustainable levels of production for economic benefits from biological resources including fish, timber, wildlife, medicinal plants and other goods and services, and placing limits on harvests.

103. The Finnish Forest Research Institute has studied the possibilities of launching payments for forest ecosystem services in Kuusamo, northeastern Finland where a large share of forestland is privately owned and has been intensively managed for timber production. This area is an important and fast developing centres for nature-based tourism. The revenue collected from tourists could be used to compensate landowners' reduced income from forestry, for example.

104. A ministerial decree, approved in 2005, in Mozambique, requires that 20% of all government taxes and fees collected from the use of forests (including forest concessions), wildlife and protected areas, be provided to local communities. The Forest and Wildlife regulation also establishes that 50% of fines collected from offenders of the legislation are given to forest patrol agents and community members who participate in law enforcement activities or report offenders.

105. Agriculture expansion and infrastructure projects in Sri Lanka have resulted in high levels of deforestation and fragmented wildlife corridors, especially in elephant habitat critical for long-term sustainability of biodiversity. As forestry, agriculture and tourism sectors in Sri Lanka do not currently integrate biodiversity principles into their plans and policies, GEF projects have been focusing on mainstreaming community and conservation concepts into these sectors, to restore and protect catchment forests and wildlife corridors.

8. Impacts from plantations of agricultural crops

106. Over the last ten to fifteen years, extensive large-scale land acquisitions and the conversion of forests to agriculture have been linked to elevated rates of tropical deforestation in Southeast Asia.[35] For example, the conversion of naturally forested land and wetlands for agriculture, industrial plantations and aquaculture, coupled with urbanization and infrastructure development has led to the loss and fragmentation of ecosystems and natural habitats, and contributed to its degradation. In Viet Nam the conversion of degraded forest to rubber plantation has significantly reduced the area of semi-deciduous forests and other natural forests throughout the country.

107. In Ethiopia, the expansion of small scale and commercial agriculture such as sugar cane, cotton and biofuel plantations are the major development activities that are putting pressures on the size and species diversity of surrounding forest ecosystems.

108. In Indonesia, the Government launched the Indonesian Sustainable Palm Oil (ISPO) standard. Based on existing Indonesian legislation, it is designed to ensure that all Indonesian oil palm growers, not just those exporting to foreign markets, conform to higher agricultural standards.

[35] Hall, R. *et al. J. Peasant Stud*. 42, 466–87 (2015). . Miettinen, J., Shi, C. & Liew. S. *Glob. Change Biol*. **17,** 2261–2270 (2011).

109. Myanmar noted that unplanned expansion of commercial plantations, such as oil palm and cassava, is leading to large-scale conversion of forest areas. To reduce timber extraction from natural forests and to restore degraded forest areas, the Government has promoted private investment in plantations since 2006. Although past timber harvests exceeded the annual allowable cut, logging has been reduced since 2013 to within the allowable limits.

110. Rwanda has identified increased logging in the Nyungwe buffer forest zone and the loss of biodiversity in the Nyabarongo wetland due to the development of sugarcane plantations and rice fields.

111. In the southern part of South America, extensive large-scale land acquisition and consequent expansion of the cultivation of soybeans and pastures of exotic grass species jeopardize large forest areas. The Chaco region, in Paraguay, and the Cerrado in Brazil for example are amongst those biomes being lost at alarming rates by this expansion, mainly to produce fodder and beef for export.

9. Evaluation of the impact of policies

112. Although a majority of countries have shown that they are devoting resources to sustainable forestry practices, no country has reported (in 5th national reports) any form of structured programme to evaluate the impacts of such policies (with the notable exception of Brazil).[36] UNEP/CBD/SBSTTA/17/2/Add.1 underscores some common obstacles to the use of policy support tools and methodologies, especially in relation to reforming perverse incentives and leveraging positive incentive measures.

B. Case studies: approaches used for mainstreaming

113. The analysis of three country cases are grouped under the elements of the CBD expanded programme of work on forest biodiversity [37] to demonstrate the importance and interdependency of these elements for mainstreaming.

Brazil: Forest biodiversity and development

114. Between the end of the 20th century and 2004, Brazilian forests had very high and rapidly rising deforestation rates driven by land use change from expanding agriculture, among other pressures.[38] Yet, with the application of a broad range of actions and measures, deforestation rates have been greatly reduced.[39]

Institutional and socioeconomic enabling environment

115. Several polices impact the conservation and sustainable use of forest biodiversity, including: the National System of Protected Areas 2000, which regulates creation and maintenance of protected areas; the Action Plans for Prevention and Control of Deforestation in the Legal Amazon 2004 and other biomes; and the Law on Protection of Native Vegetation 2012 that controls deforestation and reforestation, and prescribes that landowners conserve certain percentages of native vegetation on their property as Legal Reserves and/or Areas of Permanent Protection. In addition, the Forest Concession System (2006) was instituted to promote the sustainable management of timber and non-timber products by the private sector in national forests. These frameworks are implemented by the Ministry of the Environment, in particular its Secretariat of Biodiversity and Forests, in partnership with other public agencies. Since 2006, the Brazil Forestry Service and the National Fund for Forestry Development were created to promote and enforce the management of federal public forests, ensuring efficient and rational use of biodiversity and other ecosystem benefits.

[36] See UNEP/CBD/SBSTTA/19/4 on "Tools to Evaluate the Effectiveness of Policy Instruments for the Implementation of the Strategic Plan for Biodiversity 2011-2020".
[37] The three elements are: institutional and socioeconomic enabling environment; conservation, sustainable use and benefit sharing; and knowledge assessment and monitoring.
[38] Brazil. (2015). Brazil's Fifth National Report to the CBD. Available at: https://www.cbd.int/doc/world/br/br-nr-05-en.pdf
[39] Secretariat of the Convention on Biological Diversity (2014). *Global Biodiversity Outlook 4*. Montréal.

Conservation, sustainable use and benefit-sharing

116. The rapid decline in deforestation in the Brazilian Amazon is credited to an effective mix of policy initiatives, coordinated through the Action Plan for the Prevention and Control of Deforestation 2004. These include monitoring of land cover to crack down on illegal deforestation; enforcement campaigns; incentive measures; expansion of the protected area network; building awareness of biodiversity; and credit embargos to landowners in municipalities with top rates of deforestation.

117. In terms of reforestation, the Law on Protection of Native Vegetation 2012 is complemented by an online Rural Registry Monitoring system, remote sensing and tougher sanctions to enforce compliance. The Law on Protection of Native Vegetation 2012 also introduced the Environmental Reserve Quota as an incentive mechanism, whereby a tradable legal title is given to areas with intact or regenerating native vegetation exceeding the law's requirements.[40] Following the Law on Protection of Native Vegetation 2012 (and the old Forest Code), the state of Sao Paulo established a state decree for forest restoration practices (2011), including explicit obligations for biodiversity. For example, restoration projects need to contain a minimum number of native species.[41] The Forest Concession System (2006) was instituted to promote the sustainable management of timber and non-timber products by the private sector in national forests. The Forest Concession System contracts allow the use of forest resources through low-impact sustainable forest management techniques.

118. Cross-agency initiatives have also been introduced to jointly address forest biodiversity and development. For example, the Bolsa Verde Programme (2011) helps extremely poor families develop forest conservation activities, as part of the Brazil without Extreme Poverty Plan.[42] In another example, under the National System of Protected Areas 2000, local communities are granted priority access to public forests and benefits resulting from their use and conservation. The Federal Programme on Community-based and Family-based Forest Management was instituted to provide effective implementation of incentive instruments, technical assistance, capacity building and more to aid communities to sustainably use timber and non-timber forest products.[43]

Knowledge assessment and monitoring

119. Several programme evaluations have been conducted. A report from 2013 notes a reduction in Amazon deforestation by 70% below the historical 1996/2005 baseline.44 Monitoring data shows that 25 % of all forests converted to pastures and crop areas in the Brazilian Amazon in the past 30 years are now under regeneration with low secondary forests.[45] After the re-enactment of a Sao Paulo state decree, the quantity and diversity of Atlantic Forest native species produced in Sao Paulo state nurseries have greatly improved.[46] Strengthened community based forest management in the Caatinga biome has contributed to the conservation of over 15,000 hectares of native Caatinga.[47]

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[40] Soares-Filho B, Rajao R, Macedo M, Carneiro A, Costa W, Coe M, Rodrigues H and Alencar A (2014). Cracking Brazil's Forest Code. *Science* 344, 363-364.
[41] Aronson, James, et al. (2011) What Role Should Government Regulation Play in Ecological Restoration? Ongoing Debate in São Paulo State, Brazil. Restoration Ecology Vol. 19, No. 6, pp. 690–695. Brancalion, P.H. S., et al. (2011) Improving Planting Stocks for the Brazilian Atlantic Forest Restoration through Community-Based Seed Harvesting Strategies. Restoration Ecology Vol. 20, No. 6, pp. 704–711.
[42] Brazil. (2015). Brazil's Fifth National Report to the CBD. Available at: https://www.cbd.int/doc/world/br/br-nr-05-en.pdf
[43] Ibid.
[44] Soares-Filho B, Rajao R, Macedo M, Carneiro A, Costa W, Coe M, Rodrigues H and Alencar A (2014). Cracking Brazil's Forest Code. *Science* 344, 363-364.
[45] Brazil Ministry of the Environment, PROBIO Project. (2007). Mapping of Vegetation Cover of the Brazilian Biomes at the scale of 1:250,000 baseline year 2002. Available at: http://www.mma.gov.br/images/publicacoes/biodiversidade/probioIeII/mapas_cobertura_vegetal_ingles.pdf
[46] Brancalion, P.H. S., et al. (2011) Improving Planting Stocks for the Brazilian Atlantic Forest Restoration through Community-Based Seed Harvesting Strategies. *Restoration Ecology* Vol. 20, No. 6, pp. 704–711
[47] Brazil. (2015). Brazil's Fifth National Report to the CBD. Available at: https://www.cbd.int/doc/world/br/br-nr-05-en.pdf

120. Since 2002, Brazil's National Institute for Space Research, tied to the Ministry of Science and Technology, has used different systems of satellite imagery to assess the extent and rate of gross deforestation in the Brazilian Amazon, including DETER (near-real time deforestation detection). There are also efforts to generate more precise observations of biodiversity through in situ biodiversity monitoring, such as: ICMBio, a monitoring programme involving local people in the monitoring of biodiversity; and SiBBr, an Information System that aims to integrate scattered sources of information enabling easier access by decision makers.[48]

Conclusion

121. Deforestation is at the forefront of environmental concerns for Brazil. Given its importance, in Brazil's mix policies there are explicit pursuances of biodiversity and forestry conservation objectives, a number of which are integrated into wider policy concerns, such as development. Along with Brazil's continued investment in developing monitoring and enforcement capabilities, Brazil has made clear steps towards mainstreaming the conservation and sustainable use of forest biodiversity into numerous policies, strategies and practices of key public and private actors.

South Africa: Natural Resources Management Programme and the Grassland Programme

122. Over 40 percent of South Africa's terrestrial ecosystems are threatened; with forests being one of the worst biomes affected, although forests are among the most protected ecosystems. Pressure on terrestrial ecosystems include degradation of natural habitats, invasive alien species, pollution and waste, climate change and loss of habitats, due to increasing conversion for cultivation, mining, forest plantations and urban expansion.

Institutional and socioeconomic enabling environment

123. Several polices affect the conservation and sustainable use of forest biodiversity, these include: the Protected Areas Act (2003); the Biodiversity Act (2004) which provides an overarching framework for the coordinated management, conservation and sustainable use of biodiversity; and the National Forest Act (Act 84 of 1998) promoting the sustainable management and development of forests.

124. These legislative frameworks are implemented by three national public sector institutions: the Department of Environmental Affairs (DEA), which ensures the protection of the environment and natural resources, balances sustainable development with the equitable distribution of benefits arising from natural resources; the South African National Biodiversity Institute (SANBI), which conducts biodiversity research as well as monitors and reports on the state of biodiversity, with the aim of providing planning and policy advice; and the South African National Parks (SANParks), which conserves, protects, controls and manages a system of national parks and other defined protected areas.

125. These institutions are supported by provincial departments and conservation authorities, including the Department of Agriculture, Forestry and Fisheries (DAFF), which manages the National Forest Act and the South African National Forestry Stewardship Council (FSC), which reviews and ratifies forest standards. Indigenous forest biome (as opposed to forestry plantations) represents less than one percent of the country's surface area.[49]

Conservation, sustainable use and benefit-sharing

[48] Ibid.

[49] Mucina, L. and Rutherford, M.C. (eds.). 2006. The Vegetation of South Africa, Lesotho and Swaziland. Strelitizia 19. South African National Biodiversity Institute, Pretoria, South Africa. (808 pp with CD GIS-database).

126. The main forestry institutions of the Government of South Africa list a number of key national actions and outcomes in South Africa's fifth national report to the CBD for Targets 4, 5, 7 and other relevant targets. For example, efforts by SANBI include the established National Botanical Gardens, including the 160 ha of pristine coastal dune forest in the north east of the Limpopo Province, bringing this area under sustainable management. In addition, the Natural Resources Management Programme (formerly the Working for Water Programme) of the DEA, has a few sub-programme related to forests that directly link sustainable development and management, such as: the Working for Forests, which converts invading alien plants into usable resources for basic community needs; and the Working for Energy and Eco-Furniture Factories, which respectively use biomass cleared by the Working for Water to generate energy and manufacture low cost furniture.

127. In another example, the Grassland Programme, funded through a Global Environment Facility investment of $8.3 million, aims to mainstream biodiversity into key production sectors, including forestry, and to reduce the footprint of these sectors and prevent further biodiversity loss in priority areas in the grassland biome. The grassland biome covers about 30 percent of South Africa's land surface and stretch across nine provinces. About 90 percent of forestry plantations occur in the grassland biome, with about 80 percent of them being management by large companies and the rest managed by small communities.[50] To enable improved decision making a significant number of biodiversity mainstreaming tools have been developed with the forestry sector, including the Guidelines for Grasslands Management in the Forestry Sector, Environmental Guidelines for Commercial Forestry in South Africa, as well as Biodiversity Screening and Conservation Planning Tools. Standards of the South African National FSC are being developed for indigenous forests, large plantations and small and medium scale plantations. These sets of standards intend to ensure improved policy foundations for forestry management and create an enabling environment for integrating biodiversity-friendly practices into production processes.

Knowledge assessment and monitoring

128. Few evaluations of the programmes and projects carried out by the main forestry institutions and their supporting organizations have been conducted. Mainstreaming efforts under the Grassland Programme, for example, has resulted in forestry practices that explicitly incorporate biodiversity objectives through proper management. A study on the establishment and progress of the Working for Water Programme reported that evaluations of the Programme, directly linking to sustainable development and management, have led to improvements, including in the delivery of economic and environmental benefits, legislations and inter-agency coordination.[51]

Conclusion

129. The proportion of land area covered by forests in South Africa is small, but forests make a disproportionably high contribution to the conservation of South Africa's biodiversity. Despite, the fact that forest ecosystems in South Africa are relatively well protected, they still face a number of threats. The national and sub-national forest institutions in South Africa are addressing these threats through programmes that link sustainable development and management as well as a host of enabling factors, such as programmatic reviews, legislative reforms and inter-agency coordination.

Malaysia: the protected area approach

[50] Godsmark, M. 2014. The South African Forestry Industry's Perspective on Forestry and Forest Products Statistics. Presentation to FAO Workshop on Forest Products Statistics, 27th November 2014.

[51] Sykes, Gillian, and Meagan Jooste, with Dr Christo Marais. (2014) Leveraging public programmes with socio-economic and development objectives to support conservation and restoration of ecosystems: Lessons learned from South Africa. Secretariat of the Convention on Biological Diversity. Available at https://www.cbd.int/ecorestoration/doc/South-Africa-Final-Version-20150114.pdf

130. In Malaysia, tropical rainforests constitute the core of biodiversity. The Government is committed to maintaining at least 50% of land area under forests and tree cover in perpetuity.[52] The main threats to forest areas are land use change for agricultural use and other developmental activities.

Institutional and socioeconomic enabling environment

131. Malaysia has numerous laws that affect the conservation and sustainable use of forest biodiversity at the Federal and State levels, some of these are: the National Forestry Act 1984, National Policy on the Environment 2002, the Wildlife Conservation Act 2010, National Policy on Biological Diversity 1998, the Land Conservation Act 1960, the National Land Code 1965, the State of Sabah Parks Enactment 1984, the State of Sabah Forest Enactment 1968, and the State of Sarawak Forest Rules 1962. In particular, the National Forest Policy 1978, currently under revision, aims to conserve and manage the country's forest based on the principles of sustainable management; to conserve biological diversity, and genetic resources; and to enhance research and education. It also provides for the development of comprehensive programmes in community forestry and support for intensive research programmes in forest products.[53]

132. These legislative frameworks are implemented by a number of Federal and State level institutions, such as: Department of Environment, Forest Research Institute Malaysia, Forest Stewardship Council, National Forestry Council of Malaysia, Forestry Department Peninsular Malaysia, Sarawak Forestry Corporation, and the Sabah Forestry Department. For example, National Forest Policy 1978 provides the Forestry Department Peninsular Malaysia with guidance for the implementation of sustainable forest management initiatives.[54]

133. Supporting these laws are national-level planning policies that integrate development, such as the Five-Year Malaysia Plan, National Physical Plan and other sectoral national policies passed by the Cabinet. These planning policies provide guidance for the development of state and regional development plans and sectoral policies. The overall goal of the National Physical Plan is to establish an efficient, equitable and sustainable national spatial framework to guide the overall development of the country. Its framework has eight themes, including: setting a national spatial framework; enhancing economic competitiveness; conserving agricultural resources and rural development; sustainable tourism development; and conserving natural resources, biodiversity and the environment. The National Physical Plan is implemented by federal departments and ministries, state governments and local authorities.

Conservation, sustainable use and benefit sharing

134. Malaysia’s approach to biodiversity conservation and sustainable use is rooted in the protected area approach whereby areas identified as significant for biodiversity and its ecosystem values are protected by virtue of legal gazette and accorded varying levels and status of protection. In relation to forest biodiversity, these take the form of totally protected areas, national parks as well as wildlife sanctuaries.

135. In 2012, approximately 21.01 million hectares or 63% of Malaysia remains forested. Of this area, nearly 13 million hectares have been designated as permanent reserved forests (PRF) and/or permanent forest estates with each state responsible for drawing-up their Forest Management Plans based on SFM practices.[55] SFM ensures the commercial aspect of forestry by allowing controlled logging in PRFs; the social aspect that ensures that communities that rely on the forests for their livelihood can continue to do so; and the environmental aspect by stipulating criteria to conserve the forest ecosystem. A number of initiatives carried out by Federal and State level institutions are presented in the Fifth National Report.

[52] Government of Malaysia, Ministry of Natural Resources and Environment. (2014). Fifth National Report to the Convention on Biological Diversity. Available at https://www.cbd.int/doc/world/my/my-nr-05-en.pdf
[53] Ibid.
[54] Ibid.
[55] Ibid.

Knowledge assessment and monitoring

136. Monitoring of the National Physical Plan entails the establishment of the Land use Planning Intelligence System, data sharing measures, and the development of the National Physical Plan Monitoring System. These stipulate reviews every five years and that data be made available for the review. Difficulties of the Plan include weak monitoring and updating capacities, long gestation periods to implement spatial policies, lack of databases for strategic planning and poor sectoral integration.

137. Malaysia's fifth national report does not provide any evaluation or assessment of the projects or programmes mentioned. Rather, it states that the lack of a cohesive and comprehensive monitoring mechanisms/indicators towards the National Policy on Biodiversity have posed challenges towards measuring actual progress in certain conservation areas.

Conclusion

138. Although forest biodiversity is highly valued in Malaysia, forests continue to face threats, which the Government is addressing through a number of initiatives. As a result, the structure of the protected area system is highly complex, involving a number of categories and sub-categories, and implemented through a host of Federal and State level institutions that work both independently and inter-dependently. Whether this approach is successful in maintaining at least 50 % of land area in Malaysia under forests will be determined over time.

V. SYNTHESIS OF THE ROLE AND BENEFITS FROM MAINSTREAMING

139. Forests play a key role in the economy of many countries. With biodiversity directly responsible for approximately 40% of the world's economy, particularly in sectors such as agriculture and forestry, it is imperative for society to conserve, restore and wisely use this natural capital. Biodiversity provides crucial ecosystem services for the forest sector, such as wood, foods, clean water and fertile soil.

140. Forests can be a resource for poverty eradication. About 70% of the world's poor live in rural areas and depend directly on biodiversity for their survival and well-being.[56] These people obtain basic necessities, such as nutritious food, adequate shelter, access to health services, energy sources, and safe drinking-water from the forest. For example, forest products are estimated to make a significant contribution to the shelter of at least 1.3 billion people, or 18 percent of the world's population and about 2.4 billion people cook with woodfuel (about 40% of the population of less developed countries). Urban centers also depend on forested areas, for water supply, and benefit from the multiple environmental services of urban forests and trees.[57]

141. Mainstreaming biodiversity into forestry is a process involving all levels of government including multiple departments and agencies, as well as the public and private sectors. Policy interventions are needed not just in the forest sector, but in other sectors, to reduce pressures on forests caused, for example, by agricultural expansion, livestock production, extractive activities, road building, illegal logging, and extensive use of woodfuel associated with subsistence farming. Conserving forests will require greater country and regional specific understanding of external factors, such as the role of fiscal policies and incentives for agricultural commodities and energy sources, as well as the role of other economic global factors that influence changes in land use and forest cover.

[56] Secretariat of the Convention on Biological Diversity. 2009. Sustainable Forest Management, Biodiversity and Livelihoods: A Good Practice Guide. Montreal, 47 + iii pages.
[57] FAO 2007.

142. Thus, public policy and related fiscal policies and incentives should inevitably look for coherence among those productive sectors to avoid conflict over competing land uses.[58] Phasing out harmful incentives and reforming fiscal policies form part of the solution to achieve sustainability among different land uses. Ultimately, in order for governments to address these pressures they must influence theses underlying drivers associated with the production of agricultural commodities. In doing so, REDD+, for example, provides a framework to rethink current fiscal and departmental structures as part of National REDD+ Strategies and Actions.[59] There is no single solution for countries to make changes to their agricultural fiscal incentives. National circumstances vary and each country will have a different approach to identify how their fiscal policies and incentives can overcome the conflicts between sectors and competing land uses.[60]

143. Further efforts should be taken to help countries identify the main trends impacting natural forests, in order to identify and scale up measures to assess changes in forest area and forest cover. Among the main challenge in data collection is to ensure information that monitors the biodiversity conditions in forest ecosystems, distinguishing with those that pose a threat to biodiversity. Using FRA data as well as other sources of information, such as the Global Forest Change dataset, could help provide a better understanding of the extent and condition of, and impacts to, forests so as to inform progress in meeting several Aichi Targets by 2020.

144. While mainstreaming has much to do with policy coherence, it also has to do with the use of known methodologies, datasets, approaches and indicators that could serve, in one way or another, different policy fields. Discussions on indicators for global reporting processes, including for CBD, UNCCD, UNFF reporting and the Sustainable Development Goals provides an opportunity to enhance the coherence of technical information that supports decision making. This could also enhance baseline information used to assess forest biodiversity status, impacts and trends.

145. The 2030 Agenda for Sustainable Development can serve as a framework to champion transformational change, whereby biodiversity and its role in maintaining healthy, productive and resilient forest ecosystems and natural habitat, among other ecosystem functions, are accounted for, under the Sustainable Development Goals 6, 13 and 15. A unified approach to these Sustainable Development Goals and relevant forest targets, could promote consistency with the implementation of the Strategic Plan for Biodiversity 2011-2020, National Determined Contributions under the UNFCCC, UNCCD Land Degradation Neutrality Goal, other policy instruments, including the Strategic Plan of the International Arrangement on Forests 2017-2030, the World Bank Group Forest Action Plan FY16–20, the International Tropical Timber Agreement 2006, the ITTO Strategic Action Plan 2013-2018, the FAO Strategy for Forests and Forestry, and other relevant instruments of other member organizations of the Collaborative Partnership on Forests, as others like the Sendai Framework for Disaster Risk Reduction.

146. Successful mainstreaming requires an informed public. Countries should make concerted efforts to educate the public on forest benefits, their relationship with biodiversity conservation and sustainable use and their value to humanity. A public that is unaware of the benefits and roles forest play could undervalue forest biodiversity, including its contribute to a range of ecosystem services, and misguide attention especially in light of Sustainable Development Goal 15, Target 15.2, which calls to significantly expand reforestation and afforestation. Educational programmes on forest biodiversity could facilitate a broad understanding of the sectoral issues and challenges, addressing the connections across social aspirations, economic imperatives, and biodiversity considerations. Consumer forums and roundtables can serve to promote the information and involvement of multi-stakeholder processes at all levels.

[58] Kissinger, G (2015). UN-REDD policy brief on 'Fiscal incentives for agricultural commodity production: Options to forge compatibility with REDD+.
[59] Ibid.
[60] Kissinger, G (2015). Changing agricultural fiscal policies to stimulate sustainable economic growth, food production, and reduced deforestation.

147. Determining the access to, and distribution of, benefits from the use of forests is an extremely important issue. In this regard, it is important to have strong public institutions, at different levels of government, directly involved with the legislation process, approval and monitoring of management plans. Moreover, public investment should target capacity building and specialized trainings for forest technicians to interact and discuss management practices with smallholder and agriculture producers.

148. Participation is essential to promote conservation and partnerships are key for mainstreaming biodiversity across forestry and others sectors of the economy. As forest managers in most countries do not govern all the components of the forest, close cooperation is required with other sector entities and broader stakeholders. For example, community forestry offers considerable contributions to the conservation and sustainable use of forest biodiversity, including through community-based monitoring, ecosystem management, and raising attention of severe threats. With secure tenure rights, Indigenous Peoples' territories and other community-conserved areas can play an effective role to reduce deforestation. Participation that nurtures a rights-based approach could help empower disadvantaged people, in particular women, in forest-related aspects and strengthen their contribution to sustainable development. Along with partnership arrangements, multi-sector participation and management requires a coordinated mechanism that is transparent, accountable and inclusive, and provides clear rules and decision-making processes.

VI. PRIORITY AREAS FOR FURTHER WORK

149. Forests are one of the main strategic themes that will be addressed at the thirteenth meeting of the Conference of the Parties (COP13). Forest conservation and their sustainable management are central to achieving the Strategic Plan for Biodiversity 2011-2020. As such, this document illustrates the importance of biodiversity in sustainable forest management and identifies actions to improve the integration of biodiversity objectives within the forest sector. It can also serve as a tool for each country to review and analyze their internal national biodiversity policy to check how integrated it is across sectors, and to help make informed decisions.

150. Building on past decisions adopted by the Conference of the Parties, COP13 could identify key interventions to be championed by the forestry and biodiversity communities. Actions that could be explored to help inform policies and measures to reduce natural habitat loss, include identifying, at the national level, the direct and indirect causes of loss with the greatest impact on biodiversity. Further global support could focus on the application of tools, databases and methods for inter-sectoral spatial planning; using safeguards and indicators for biodiversity; making real-time forest data and imagery freely available for land use planning; linking secure tenure patterns with long-term sustainable management; and accounting for the values of forest biodiversity and ecosystem functions and services.

151. Developing a clear legal or policy framework for land use or spatial planning that reflects national biodiversity objectives should also be promoted. Such actions will require strong and continued political will and leadership to effectively mainstream biodiversity into national forest frameworks. Cooperation between stakeholders could be leveraged through cross-agency joint programming, planning and budgeting; accountable governance; multi-purpose incentives; and shared information and monitoring systems. The FAO could collaborate with the CBD on this matter to strategically address forest governance arrangements, ensuring that appropriate ecosystem conservation and restoration aspects are factored into such arrangements. Case studies and an exchange of lessons learned could bring value to on-going efforts, and identify where further support could be needed.

152. Further work should also examine how best to align existing incentives to national objectives for land use and spatial planning, and, to use further incentives to reduce habitat loss, degradation and fragmentation, including as appropriate, payments for ecosystem services and REDD+ mechanisms. Channeling public and private sources of finance into practices that reduce deforestation and support the restoration of critical ecosystems, in a way that does not cause harm to other ecosystems, complying to legal environmental regulations, should also be explored.

153. Government involvement should complement sectoral action in aspects as tenure security for forest smallholders, Indigenous Peoples and Local Communities, land-use planning to secure benefits of land-sparing, and provide positive regulatory and fiscal incentives to enable access to resources that improve their forestry practices, including community and local based forestry. Financial investment may also be needed to provide alternatives for wood based energy sources, thereby reducing the demand to convert natural habitats.

154. Because of the high biodiversity contained in forests, and value of well managed forests for conserving this biodiversity, any option that reduces incentives to convert forests rather than manage them for timber and other products and services is beneficial for biodiversity conservation. In a general sense, this implies strengthening the business case for sustainable forest management, based on a broad range of forest products and services, and viable, risk-mitigated investment opportunities, and making the business case for illegal logging and trade less attractive, through governance reform, law enforcement and closing markets for illegal produce.

155. The options to reduce biodiversity loss, while maintaining production of an increased demand for fiber are already shifting production to high-yield plantations established in degraded and low-biodiversity areas, implementing sustainable forest management in semi-natural forests and increasing processing efficiency and the re-use and recycling of wood products. Concerted efforts will require the engagement and support of Indigenous Peoples and Local Communities, landowners, other stakeholders and the general public in activities to ensure that products are produced from legally sourced commodities.

156. Combating illegal logging, stimulating certification systems and creating local markets for sustainably produced forest products will still remain a challenge for many countries. However, as a large part of global wood use is driven by local informal wood production and collection, options to reduce biodiversity impacts of the informal and small scale sector should address the underlying governance and market failures that constrain this sector and favour the persistence of unsustainable practices. For local and subsistence use, wood production outside the forests such as in agro-forestry systems and micro-plantations could play a large role.

157. Well-managed forest protected area networks and other area based conservation measures, with managed buffer zones, where appropriate, can serve as effective instruments for conserving forests and other habitats. Such instrument will also require applying spatial and land use-planning tools to identify areas of particular importance to forest biodiversity, taking into account Aichi Target 11, as a measure to safeguard ecological representation and spatial connectivity, ensuring that forest management and other land use practices are situated, appropriately, without degrading biodiversity.

158. Monitoring land use and land-cover including, where possible, near-real-time monitoring to inform enforcement actions, as well as regular comprehensive assessments of land use and land-cover change should be promoted, extending the know-how in these tools to other countries. Regional criteria and indicators for sustainable forest management could also serve to monitor progress in conserving biodiversity through forest management practices.

159. Data on the reproductive and development characteristics of tree species is important, as are species distribution maps. In the absence of scientifically assessed population data and intra-specific genetic information, a short-term alternative could be to maintain multiple populations of the targeted species selected from throughout its natural distribution and covering different climatic zones and soil types. Countries with limited resources will need to build synergies among programmes and institutions at the national, regional and international levels to minimize constraints. While some countries have information from forest genetic related activities in the public sector, they tend to lack information from the private sector. This signifies the need for integrated and harmonized documentation and data gathering activities between the sectors.

160. Economic development policies should consider the value that forests provide locally, nationally, regionally and internationally, as well as the trade-offs involved in deforestation. The use of government-imposed

financial penalties on landholders who violate laws restricting deforestation has shown some promise. Monitoring and reducing the impacts from the banking sector, both domestic and international, in promoting land clearing and sowing is also crucial.

161. Learning from other countries that have already succeeded to halt deforestation, often through very straightforward deforestation bans and other regulatory measures should also be promoted. To leverage successful policies, the CBD Secretariat, together with FAO Forestry Department, could help facilitate an exchange of experiences among countries, examining successful forest policies in countries which can provide guidance on compliance measures to Sustainable Development Goal 15, Target 15.2, and Aichi Target 5.

162. Policy planning and coordination will be needed at all levels. Sustainable Development Goal 15, Target 15.2 on halting deforestation by 2020,[61] provides a significant entry point, as it highlights how halting deforestation is a pre-condition for sustainable development. The key challenge for the CBD is to support governments in their efforts to implement Sustainable Development Goal 15, benefiting from efforts taken to advance Aichi Biodiversity Target 5 among others. In addition to promoting sustainable use practices, primary conservation will seek efforts to halt deforestation in order to recover quality and extent of forest cover. In this regard, tools, standards and guidelines should be promoted in a manner that incentivizes actors to modify current forest practices that may be degrading biodiversity.

163. The experience garnered and initiatives carried out by countries have helped to improve information on biodiversity mainstreaming and to transfer such knowledge to other countries and in other fora. What may be needed is a deeper historical analysis of the forest, energy, agricultural and land use policies of those countries that have succeeded to halt natural forest loss. This would send a strong message that halting deforestation by 2020 is eminently possible. In many cases, deforestation bans, effective forest law enforcement, the appropriate recognition of indigenous territories, community conserved areas and community conservation initiatives, the promotion of alternative, sustainable forms of energy, the reduction of wood consumption in general, and land-sparing policies that free up land for forest and other ecosystem restoration, have proven to be effective.

164. Ongoing activities of the CPF to promote sustainable forest management, reduce the rate of deforestation and forest degradation and define priorities under the 2017-2030 Strategic Plan of the International Arrangement of Forests should look to effectively align global efforts in support of forest conservation, use and management. Under the new CPF work plan, members could also aim to strengthen efforts to streamline forest-related reporting, and to review, as required, key global forest terms and definitions. Moreover, the demonstration of synergies with other global policy agendas, such as on climate change mitigation and adaptation, and in meeting the 2030 Agenda for Sustainable Development can be levers for financial resource mobilization for forests.

165. Considerations to revise the CBD Forest Biodiversity Programme of Work, based on advances in forestry in the past 15 years, may also be needed because of considerable advances in forest science, remote sensing, and forest management planning over the past decades, as well as substantial changes to the global forest. The comprehensive programme of work on forest biodiversity was first adopted in 2002 and revised in 2008.[62] Parties to the CBD are committed to implement 129 actions under the programme of work on forest biodiversity, framed under 3 thematic elements and 12 goals. Many of the actions of the programme of work contribute to the forest-related Aichi Biodiversity Targets, aimed at promoting land use planning that integrates biodiversity considerations, reducing deforestation and forest degradation, expanding forest protected areas, restoring forest lands, creating an enabling policy environment for sustainable forest management, enhancing sustainable livelihoods, and promoting knowledge, assessments and monitoring.

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[61] https://sustainabledevelopment.un.org/?menu=1300
[62] Decision IV/22 and IX/5. Overview of the expanded programme of work on forest biodiversity: www.cbd.int/forest