UNEP

CBD

Convention on Biological Diversity

Distr.
GENERAL

UNEP/CBD/SBSTTA/18/INF/2
9 June 2014

ENGLISH ONLY

SUBSIDIARY BODY ON SCIENTIFIC,
TECHNICAL AND TECHNOLOGICAL ADVICE
Eighteenth meeting
Montreal, 23-28 June 2014
Item 3.1 of the provisional agenda*

DRAFT OF THE FOURTH EDITION OF THE GLOBAL BIODIVERSITY OUTLOOK

Note by the Executive Secretary

I. INTRODUCTION

1. In decision XI/3 C, the Conference of the Parties, drawing on the detailed guidance on scope and preparatory process provided by the Subsidiary Body on Scientific, Technical and Technological Advice in recommendation XVI/2, requested the Executive Secretary to make a draft of the fourth edition of the Global Biodiversity Outlook (GBO-4) available for review at a meeting of the Subsidiary Body on Scientific, Technical and Technological Advice prior to the twelfth meeting of the Conference of the Parties (decision XI/3 C, paragraphs 1 and 7 (g)).

2. The current note contains a draft of the fourth edition of the Global Biodiversity Outlook that is being made available for peer-review until 9 July 2014. Until the official publication, the data, material and messages contained in these drafts may not be republished, displayed, distributed, or transmitted in any manner, nor may the material, or portion thereof, be copied or posted on any other website or network or otherwise distributed, quoted or cited.

3. This note compliments UNEP/CBD/SBSTTA/18/2 which contains the draft executive summary and main messages of the report. It is also complimented by a note on the implication of the key findings to the work of the Convention (UNEP/CBD/SBSTTA/18/2/Add.1). Further, this note is accompanied by supporting technical documents (UNEP/CBD/SBSTTA/18/INF/8 and 9).

4. A review template for providing comments can be accessed from http://www.cbd.int/gbo4review/. To ensure that your comments are given due consideration, please send them by e-mail to secretariat@cbd.int or by fax at: +1 514 288 6588, at your earliest convenience but **no later than 9 July 2014**. Should you have any questions regarding the review process, please contact GBO4@cbd.int.

* UNEP/CBD/SBSTTA/18/1.

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Annex

DRAFT OF THE FORTH EDITION OF THE GLOBAL BIODIVERSITY OUTLOOK

Note:

This is a draft for review. The report will be revised in light of review comments, and also updated to take into account additional material from the fifth national reports and updated national biodiversity strategies an action plans. It will also be fully referenced. The list of references in this draft is incomplete. Please refer to the chapters of the Technical Report (UNEP/CBD/SBSTTA/18/INF/8) for references. The figures will be redrawn and many of them will be simplified.

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FOREWORD (S)

TO FOLLOW

EXECUTIVE SUMMARY

PUBLISHED AS UNEP/CBD/SBSTTA/18/2

PART I- INTRODUCTION

The Third Global Biodiversity Outlook (GBO3)

This Outlook is the fourth in the series of global assessments of the state of biodiversity produced by the Secretariat of the Convention on Biological Diversity (CBD) (see Box 0.1). The Third Global Biodiversity Outlook (GBO3), published in 2010, presented some stark messages for the global community.

At the heart of GBO3 was the conclusion that the target to reduce significantly the rate of biodiversity loss by 2010 had been missed.

GBO-3 warned that all major pressures on biodiversity were increasing. These included:

- Loss, degradation and fragmentation of natural habitats;
- Overexploitation of biological resources, in particular through overfishing;
- Pollution, in particular the buildup of nutrients such as nitrogen and phosphorous in the environment;
- The impacts of invasive alien species on ecosystems and the services they provide to people; and
- Climate change and acidification of the oceans, associated with the buildup of greenhouse gases in the atmosphere.

GBO3 also concluded that some ecosystems were being pushed towards critical thresholds or tipping points. If these thresholds were passed, there was a real risk of dramatic loss of biodiversity and degradation of a broad range of services on which people depend for their livelihoods and well-being. The poor would suffer the earliest and most severe impacts, but ultimately all societies and economies would be affected.

GBO3 also concluded, however, that biodiversity loss could still be slowed and, in time, even halted, if Governments and society took coordinated action at a number of levels. This meant addressing the underlying causes or drivers of biodiversity loss, often embedded deep within our systems of decision-making, financial incentives and patterns of production and consumption. It also meant understanding and minimizing the pressures on biodiversity and ecosystems, and targeting measures directly at conservation and restoration of ecosystems critical to the survival of species and the provision of important services.

START Box 0.1. The Convention on Biological Diversity (CBD)
The Convention on Biological Diversity is one of the three 'Rio Conventions', emerging from the UN Conference on Environment and Development, also known as the Earth Summit, held in Rio de Janeiro in 1992. It came into force at the end of 1993, with the following objectives: "The conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding."

There are currently 194 Parties to the Convention (193 countries and the European Union).
Source: CBD
END OF Box 0.1

The Strategic Plan for Biodiversity 2011-20 and the Aichi Biodiversity Targets

GBO3 and its conclusions formed the background to the Strategic Plan for Biodiversity 2011-2020, agreed at the tenth meeting of the CBD Conference of Parties (COP10) in Nagoya, Japan in 2010.

The basis of the strategy was that biodiversity loss could only be effectively addressed with simultaneous and coordinated action at a number of levels, each of which is essential to achieve a lasting impact and to set us on a sustainable path to keep human societies within the limits of the planet's biological resources.

The strategy included an ambitious yet achievable set of 20 targets (the Aichi Biodiversity Targets), most with an end-point of 2020, ultimately aimed at achieving a 2050 vision of a world without biodiversity loss or degradation of ecosystems (see Figure 1).

The Strategic Plan for Biodiversity 2011-2020 is now accepted as the overarching framework for action on biodiversity, and the United Nations General Assembly designated the period 2011-2020 as the United Nations Decade on Biodiversity.

The plan is grouped around five interdependent Strategic Goals, addressing:

- The **underlying causes** or indirect drivers of biodiversity loss, including awareness of biodiversity and its values; the incorporation of those values into accounting systems, and decisions on economic development and planning; the subsidies and financial incentives that influence decisions affecting biodiversity; and patterns of consumption and production that determine how natural resources are used to meet the demands of our everyday lifestyles;
- The **pressures or direct drivers** on biodiversity and ecosystems, including habitat loss, degradation and fragmentation; overexploitation of biological resources with a particular emphasis on overfishing; unsustainable forms of production in key activities such as agriculture, aquaculture and forestry; pollution especially focusing on the buildup of nutrients; the introduction and establishment of invasive alien species; and the multiple pressures on ecosystems such as coral reefs especially vulnerable to the impacts of climate change;
- Actions aimed at **safeguarding ecosystems, species and genetic diversity** through direct interventions such as increasing the coverage, effectiveness and representativeness of protected areas in terrestrial, inland water and marine ecosystems; measures specifically targeting species at risk of extinction; and maintaining genetic diversity especially in plants and animal species used for crops and livestock, and their relatives in the wild;
- The safeguarding and enhancement of the **benefits of biodiversity and ecosystem services** to human societies through conservation and restoration of ecosystems especially important for the provision of essential services such as fresh water, health and livelihoods; improving and restoring the resilience of ecosystems important for adaptation to and mitigation of climate change; and implementing globally-agreed norms for the equitable sharing of benefits from access to and use of genetic resources, for example through commercialization of drugs and other products derived from biodiversity and the traditional knowledge of indigenous and local communities; and
- The means to **enhance the implementation** of all other goals within the Strategic Plan, through development and application of national strategies and plans on biodiversity; through respecting traditional knowledge and involving local and indigenous communities; through effective sharing and application of data, information and knowledge relating to biodiversity; and through adequate resourcing to support the actions needed to implement the plan.

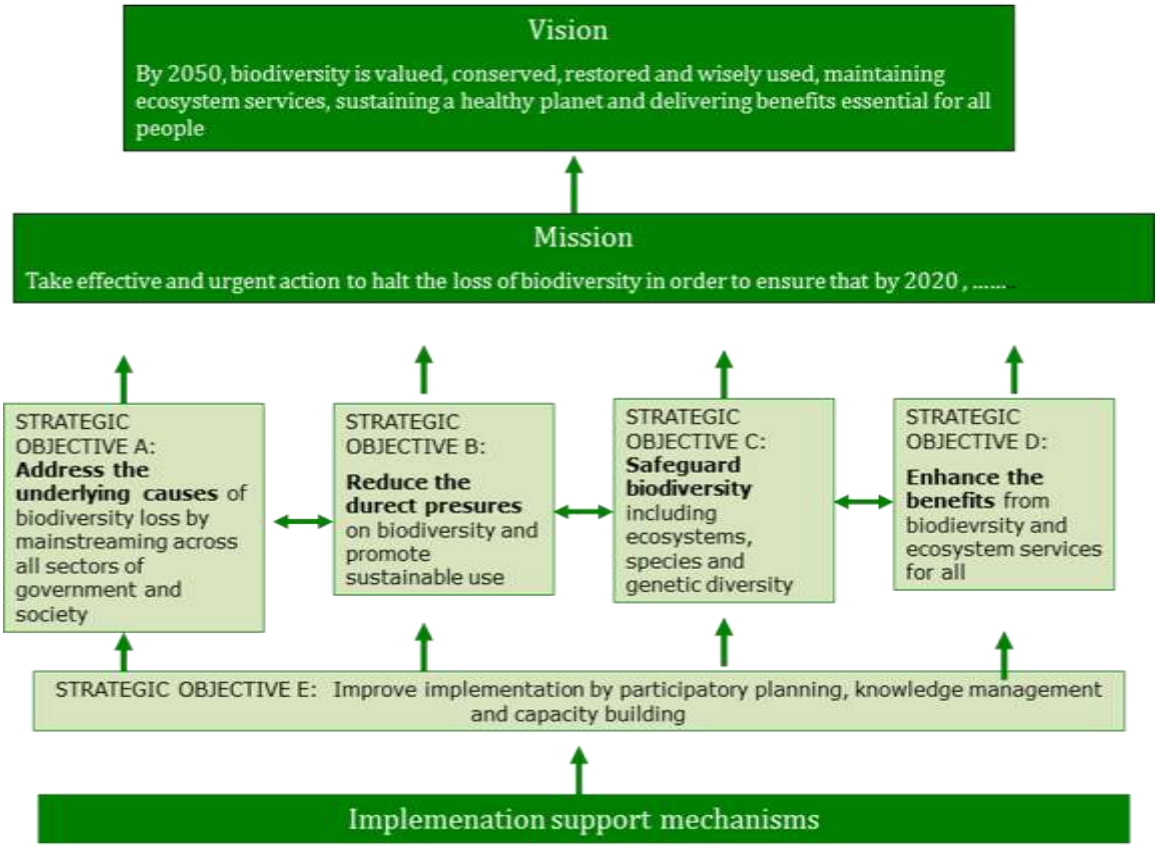


Figure 1: This diagram shows the structure of the Strategic Plan for Biodiversity 2010-20. Progress towards a 2050 Vision is achieved through a 2020 Mission. In turn, the Mission is addressed through five Strategic Goals comprising the 20 Aichi Biodiversity Targets. The Strategic Plan serves as a flexible framework for the establishment of national and regional targets and it promotes the coherent and effective implementation of the three objectives of the Convention on Biological Diversity.

About GBO4

The Fourth Global Biodiversity Outlook (GBO4) comes almost at the halfway point towards the 2020 deadline set for most of the Aichi Biodiversity Targets. It is therefore an appropriate opportunity to review progress towards the goals of the Strategic Plan, and to assess what corrective action governments may need to take to achieve the targets they collectively agreed to in 2010.

Over the following pages, progress towards each of the 20 Aichi Biodiversity Targets is addressed, including:

- an overall assessment of the likelihood of reaching each component of the target based on our current trajectory;
- a summary of the recent trends, current status and future projections relating to the target;
- examples of actions and issues helping to illustrate both the progress made and the challenges still faced (boxes within the text); and
- Key actions available to governments to help achieve each target. Where these actions contribute to several targets, the additional relevant targets are shown in parentheses.

This report brings together information derived from a wide range of sources. It draws on the outcome of a detailed assessment by a group of international experts compiled in a technical volume accompanying GBO4. This assessment addressed a range of questions relating the achievement of the Aichi Biodiversity Targets, the contribution of the Strategic Plan on Biodiversity towards the forthcoming Sustainable

Development Goals, and available pathways towards the 2050 Vision for biodiversity. The assessment itself drew from a combination of published scientific literature and relevant biodiversity indicators. The other sources of information for this report are national reports provided by Parties to the CBD as well as their national biodiversity strategies and action plans (See Box 0.2). GBO4 has also considered the results of the High Level Panel on Global Assessment of Resources for Implementing the Strategic Plan for Biodiversity.

Just as GBO3 played a major role in developing the Strategic Plan for Biodiversity and the Aichi Biodiversity Targets, GBO4 provides the evidence that should prompt renewed action by governments and the international community to achieve the goals of the Plan. Its conclusions can inform not only the CBD at its upcoming Conference of the Parties to chart new actions for the coming years, but also governments drawing up new Sustainable Development Goals whose success will depend crucially on the state of biodiversity and ecosystem services in the decades ahead.

START Box 0.2. National reports and NBSAPs1

National Reports are periodic reports provided by Parties to the Convention on Biological Diversity. They detail the status and trends of biodiversity at the national level as well the successes and challenges encountered. The fifth national reports, due in 2014, have a particular focus on assessing progress made towards the implementation of the Strategic Plan for Biodiversity. As of June 2014, reports had been received by 64 countries.

National Biodiversity Strategies and Action Plans (NBSAPS) are the principal instruments for implementing the Convention at the national level. The Convention requires countries to prepare a national biodiversity strategy or equivalent instrument, and to ensure that this strategy is mainstreamed into the planning and activities of all those sectors whose activities can have an impact, whether positive or negative, on biodiversity (see the assessment of Target 17 for further information).

END of Box 0.2

1 Note that for this draft of the Global Biodiversity Outlook information from 50 national reports were considered. The number of reports considered will be increased for the next iteration of the Outlook.

PART II - EVALUATION OF PROGRESS TOWARDS THE STRATEGIC PLAN FOR BIODIVERSITY 2011-20 AND THE AICHI BIODIVERSITY TARGETS

Strategic Goal A

Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society

Achieving this goal is critical to all other parts of the Strategic Plan for Biodiversity. It demands policy coherence and the integration of biodiversity into decisions at all levels. Failure to address the underlying causes of biodiversity loss would threaten to undermine many positive actions resulting from policies directly targeting conservation and sustainable use. GBO4 has identified important progress towards some of the targets included in this goal, for example in the integration of biodiversity into some systems of national accounting and planning, on awareness of biodiversity in some countries and on the creation of positive financial incentives for protecting biodiversity and ecosystem services. This progress varies greatly in different countries and regions, however. It is also still counterbalanced by negative drivers such as widespread subsidies harmful to biodiversity, and continuing unsustainable patterns of production and consumption. Stepping up action to address these underlying causes will be essential if the remainder of the Aichi Biodiversity Targets are to be achieved.

Target 1: Awareness of biodiversity increased

By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.

Why this target is important:

Addressing the direct and underlying drivers of biodiversity loss will require behavioural change by individuals, organizations and governments. Understanding, awareness and appreciation of the diverse values of biodiversity help to underpin the willingness of individuals to make such changes. Public awareness also underpins the political will for governments to act. Meeting this target requires that people are aware not only of the values of biodiversity in an abstract way, but know the concrete contributions of biodiversity to their lives, as well as the actions that can be taken to conserve and sustainably use biodiversity.

Summary of progress towards the target:

Target Elements (by 2020)	Status	Confidence
People are aware of the values of biodiversity	Progress towards target but at an insufficient rate	Low
People are aware of the steps they can take to conserve and sustainably use biodiversity	Progress towards target but at an insufficient rate	Low

Storyline (Recent trends, current status and projections):

Based on geographically limited survey results, public awareness of biodiversity and its importance appears to be increasing in both the developed and developing world, although with considerable variation among countries. Surveys such as the Biodiversity Barometer (see Box 1.1) show a high variation in the awareness of biodiversity and its values among people in different countries and regions.

Such surveys suggest that while people are aware that biodiversity is important for human well-being, and as a response to climate change, they do not necessarily view biodiversity protection as an important contribution to human wellbeing. With important national differences, survey respondents see biodiversity loss as a global problem but not one that is of great local concern. People are still not certain which actions have a negative impact on biodiversity, and fewer still are able to connect specific actions to biodiversity protection.[1]

Analysis of the national reports submitted to the CBD suggests that the majority of countries are taking steps to increase public awareness of biodiversity. Fewer provide evidence of programmes that focus on the actions that individuals can take to conserve and sustainably use biodiversity. Some examples of countries that have promoted such actions are given in Box 1.2.

For the few countries where recent trends are available, projections for 2020 would suggest a **continuing improvement, but not to a level where this target could be considered reached** (see Figure 1.1). There is low confidence in this conclusion because of the limited data, but a wide consensus among Parties to the CBD that more needs to be done to improve awareness of biodiversity and its values.

Actions to Enhance Progress Towards the Target:

The following actions would help to accelerate progress towards Target 1. They would also contribute to other targets, shown in parentheses:

- Facilitating and encouraging the engagement of citizens on biodiversity issues, including activities to monitor biodiversity (*Target 19*) and to promote its conservation and sustainable use (*Targets 4-15*);
- Developing and implementing coherent, strategic and sustained communication efforts, strategies and campaigns, with messages and techniques adapted appropriately for different target audiences, drawing upon social-marketing expertise, and publicising nationally relevant examples or case studies on the importance of biodiversity;
- Integrating biodiversity into national educational curricula, taking into account approaches related to Education for Sustainable Development (ESD);
- Making better use of the social sciences, including in developing a greater understanding of the social, economic and cultural drivers motivating behavioural change and their interplay, in order to improve the design of communication and engagement campaigns and of relevant policies (*Targets 2, 3, 4*); and
- Undertaking periodic and consistent assessments of biodiversity awareness, understanding, and willingness to take actions to conserve and sustainably use biodiversity to provide a basis for more targeted efforts.

START Box 1.1: Union for Ethical Bio Trade (UEBT) – Biodiversity Barometer results in 2013

Since the first edition of the Biodiversity Barometer in 2009, the global research organization IPSOS, on behalf of UEBT, has interviewed 31,000 consumers in 11 countries (see Table 1.1). Some highlights of the surveys include:

- **France:** 95% of respondents have heard of biodiversity. There is high overall awareness of sustainability: 98% are aware of sustainable development, deforestation, endangered species and fair trade.
- **Germany:** Results show a strong increase in consumer awareness of biodiversity: from 29% in 2009, to 48% in 2013. 91% of respondents know of related terms like ‘preservation of ecosystems’.

- **United Kingdom:** There is high awareness of ethics and trade (over 80%), but slightly less awareness of environmental terms (around 70%).
- **USA:** Biodiversity awareness is slowly rising among consumers (48% in 2009 to 54% in 2013). Correct definitions amongst respondents went from 26% to 39%.
- **Brazil:** There is 96% awareness of biodiversity in Brazil. Correct definitions of biodiversity are slowly rising. Awareness is driven by documentaries, school and advertising.
- **China:** 64% of Chinese consumers can define biodiversity. This is the highest rate measured in any country.

Table 1.1: Biodiversity Barometer results for 2013

Country	Percentage of respondents that have heard of biodiversity	Percentage of respondents that could provide a partial or correct definition of biodiversity	Percentage of respondents that could provide a correct definition of biodiversity
Brazil	96%	76%	51%
China	94%	86%	64%
France	95%	67%	39%
Germany	48%	34%	24%
India	19%	9.4%	0.4%
Japan	62%	50%	29%
Peru	52%	44%	7%
South Korea	73%	63%	47%
Switzerland	83%	55%	37%
United Kingdom	64%	39%	20%
USA	54%	36%	21%

END of Box 1.1

START Box 1.2. Some national approaches to public engagement on biodiversity

Japan– The Japanese Committee for the UN Decade on Biodiversity (UNDB-J) operates a 'My Declaration' programme to help people understand the connections they have with biodiversity, and to take positive action in their everyday lives. Participants choose from a list of five actions and make a declaration explaining their choice. During 2012, the programme was used at 91 events including national meetings and regional seminars, attended by a total of around 20,000 people.[2]

Belgium. The engagement campaign 'I give life to my planet' aims to engage people with biodiversity by stimulating individuals to take small and simple steps that will have long-term positive impacts. The campaign presents tools and information about 52 potential actions –one for each week of the year – relating to issues including overconsumption, over-exploitation, awareness of biodiversity values and invasive species. By 2014, nearly 24,000 people had signed up to more than 87,000 actions for biodiversity. The campaign is a close collaboration between the Royal Belgian Institute of Natural Sciences, the Ministry for Public Health, Food Chain Safety and the Environment and several partners at the regional, provincial, local and NGO-level.[3]

Benin. The Ministry of Environment of Benin initiatated a project called *'12 gestes pour la biodiversité'* (12 actions for biodiversity). The project presents information in the form of a wall calendar as well as a booklet showing a set of actions that can be carried out each month, as well as some of the important international days that can be carried out that month. The product has been used in schools and linked to capacity development activities. Plans are under way for an SMS text messaging service and other ways of spreading the message through social networking.

END of Box 1.2.

Target 2: Biodiversity values integrated

By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.

Why this target is important:

One of the persistent challenges is to include biodiversity as a significant consideration when decisions are being taken on economic development and reducing poverty. Without such 'mainstreaming', the best conservation measures can be jeopardized as development activities threaten habitats and contribute to other pressures on biodiversity. A key step towards meeting this challenge is to ensure that the true values of biodiversity to economies and livelihoods, often ignored in conventional accounting, are incorporated in the strategies and processes that drive decisions on development.

Summary of progress towards the target:

Target elements (by 2020)	Status	Confidence
Biodiversity values integrated into national and local development and poverty reduction strategies	Progress towards target but at an insufficient rate	Medium
Biodiversity values integrated into national and local planning processes	Progress towards target but at an insufficient rate	Medium
Biodiversity values incorporated into national accounting, as appropriate	Progress towards target but at an insufficient rate	High
Biodiversity values incorporated into reporting systems	Progress towards target but at an insufficient rate	High

Storyline (recent trends, current status and future projections):

Important progress has been achieved recently in incorporating biodiversity values into planning processes and strategies to reduce poverty, and integrating natural capital into national accounts. Wide variations among countries remain, but international initiatives are helping to reduce these differences.

Of 54 poverty reduction strategies examined in a recent study, nearly one third (30 per cent) showed a high level of integration of biodiversity, and this appears to be increasing over time (See Figure 2.1).[4] Around half of all countries that responded to the survey used in the study had systems of environmental-economic accounting, a framework for integrating statistics on the environment and its relationship with the economy.[5] An increasing number of developing countries are incorporating natural capital into their accounting systems, including eight members of the World Bank's WAVES partnership (see Box 2.1).[6] However, the great majority of studies assigning monetary values to biodiversity (88 per cent) have been carried out in high income or upper middle income countries.[7]

Around half of the latest national reports submitted to the CBD report include information suggesting progress towards this target. These include development of policies integrating biodiversity into land use and spatial planning, local development and poverty reduction plans. Relatively little attention is given to integration of biodiversity into national accounting and reporting systems. An example of how Kenya has accounted for the ecosystem services provided by its forests is given in Box 2.2.

Bringing all these factors together, GBO4 concludes that **while important progress has been made towards achieving all components of Target 2, significant additional actions are required to meet the 2020 deadline.**

Key actions for the future:

The following actions would help to accelerate progress towards Target 2:

- Taking account of the values of biodiversity and related ecosystem services that contribute to human well-being, in all planning and policy processes at all levels of government, including plans for development and poverty reduction. Steps could include assessing existing and planned policies, across government, affecting biodiversity, and identifying opportunities and options for addressing biodiversity concerns;
- Widely sharing information on the values of biodiversity and related ecosystem services to enable their integration across sectors;
- The further compilation of environmental statistics and building environmental-economic accounts, including by for further ddeveloping and maintaining national accounts of biodiversity-related natural resource stocks (such as forests, water) and where possible, integrating these into national financial accounts;
- Reflecting the values of biodiversity in spatial planning exercises including through the mapping of biodiversity and related ecosystem services;
- Integrating biodiversity into environmental assessment processes and making wider use of strategic environmental assessment; and

START Box 2.1: The World Bank's WAVES Partnership

In 2010, the World Bank initiated the WAVES partnership (Wealth Accounting and the Valuation of Ecosystem Services). Its main objective is *"to promote sustainable development by ensuring that natural resources are mainstreamed in development planning and national economic accounts".* WAVES helps countries to adopt and implement the System of Environmental-Economic Accounting (SEEA) – Central Framework, and helps them to develop an ecosystem accounting methodology. By 2014, eight countries had received support from WAVES to implement natural capital accounts. Botswana, Colombia, Costa Rica, Madagascar, and the Philippines were the first countries under the WAVES partnership, each applying natural capital accounting to particular sectors and economic indicators (Table 2.1). In 2013, Guatemala, Indonesia and Rwanda joined the partnership.

Table 2.1 - Accounts being implemented by WAVES partners.

COUNTRY	ACCOUNTS	PROGRESS
Botswana	Water, land and ecosystems, mineral and energy and macroeconomic indicators of sustainable development	Detailed water accounts for 2010-11 and 2011-12.
Colombia	Water and forests	-
Costa Rica	Water and forests	-
Guatemala	No information	-
Indonesia	No information	-
Madagascar	Mining, water and forests/protected areas and coastal	-
Philippines	Water, mineral, mangroves, land and ecosystem (at two identified sites) and macroeconomic Indicators of Sustainable Development.	Land cover change matrixes (for the two identified sites). Water use supply and use table.
Rwanda	No information	-

Source: WAVES 2013.

End of Box 2.1

START Box 2.2: Kenya's forest accounts[8]

Kenya's initiative to build a forestry account had as its main objective to capture information on the following:

- Value addition to forest products through the manufacturing sector;
- Provision of goods (timber and non-timber) to the subsistence economy (also referred to as the non-monetary economy);
- Supply of a set of cultural services to residents of and visitors to Kenya; and the supply of a set of ecosystem services that regulate ecological processes.

A preliminary assessment concluded that the value of the forestry sector value chain to the economy of Kenya was at least three times larger than currently estimated by Kenya National Bureau of Statistics (KNBS), accounting for some 3.6 per cent of the national economy. The value was most likely underestimated as it did not consider the tourism sector or carbon sequestration services.

Some key policy recommendations from the forestry accounting included:

- Reducing the loss of regulating ecosystem services as the cost of not doing so was 4.2 times higher than the actual cash revenue from deforestation;
- Ensuring that Kenya has in place a fully functioning forest resource account in order to fully capture the various benefits provided by the forest;
- Encouraging investment in the forestry sector in order to increase efficiency in production, especially in sawn timber and charcoal production;
- Adequate regeneration after harvest and an increased forest plantation growth in the long term, together with better coordination of regulating institutions, producers and consumers of forest products; and
- Mainstreaming the use of instruments and incentives such as payment for ecosystem services, trading and insurance schemes.

Sources: Republic of Kenya (2007). Kenya Vision 2030. A Globally Competitive and Prosperous Kenya (Kenya, Nairobi: Government printers); UNEP (2012a). Kenya: Integrated forest ecosystem services (Nairobi, Kenya: United Nations Environment Programme); UNEP (2012b). Kenya: Economy-wide impact - Technical Report (Kenya, Nairobi: United Nations Environment Programme); Mutimba, S. (2005). National Charcoal Survey of Kenya 2005.

END of Box 2.2

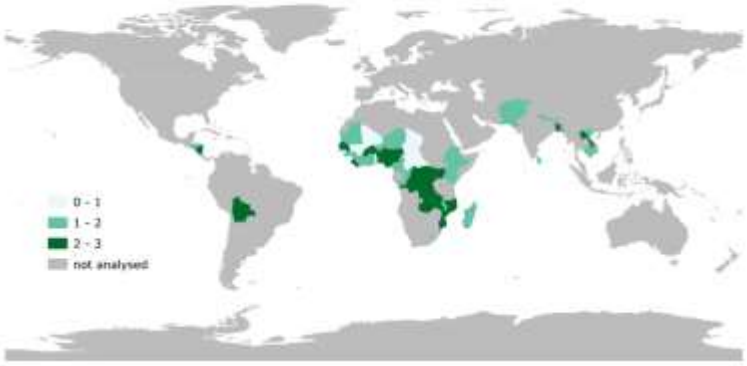


Figure 2.1 Integration of biodiversity in Poverty Reduction Strategy Papers of selected countries, scored from 0 to 3. An assessment of 3 refers to papers that have a standalone biodiversity policy. An assessment of 2 refers to papers that do not have a biodiversity policy but have an environmental policy referring to biodiversity as a key priority. An assessment of 1 refers to papers in which biodiversity is mentioned in an environmental policy but it not referred to as a priority. An assessment of 0 denotes that there is no mention of biodiversity. *Based on Roe, D. (2010). Whither biodiversity in development? The integration of biodiversity in international and national poverty reduction policy. Biodiversity 11, 13–18.*

Target 3: Incentives reformed

By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio-economic conditions.

Why this target is important:

Incentives created by government regulations have a powerful influence on behaviour affecting biodiversity, from private individuals to large corporations. The best conservation policies can easily be undermined by incentives that encourage overexploitation of resources, while conversely a well-designed system of positive incentives can encourage better stewardship of land, inland waters and oceans. Reforming these incentives is critical to addressing underlying causes of biodiversity loss.

Summary of progress towards the target:

Target elements (by 2020)	Status	Confidence
Incentives, including subsidies, harmful to biodiversity, eliminated, phased out or reformed in order to minimize of avoid negative impacts	No significant change	High
Positive incentives for conservation and sustainable use of biodiversity developed and applied	Progress towards target but at an insufficient rate	High

Storyline (recent trends, current status and future projections):

Incentives relating to biodiversity take many forms, but global information on non-financial incentives is limited. For this reason, assessment of progress towards this target concentrates mainly on trends relating to financial incentives, including both subsidies harmful to biodiversity and positive incentives rewarding behaviour that benefits biodiversity.

Subsidies in the fisheries sector, especially relating to fuel use, continue to encourage overcapacity, and if not reformed, phased out or eliminated will lead to continued decline in marine fish populations and ecosystems. Fisheries subsidies also create trade distortions, harming livelihoods in regions such as Africa where subsidies are relatively low.[9] Eliminating or reforming all harmful fishing subsidies would save billions of dollars per year, and increase both the size and value of catches in the long term.[10]

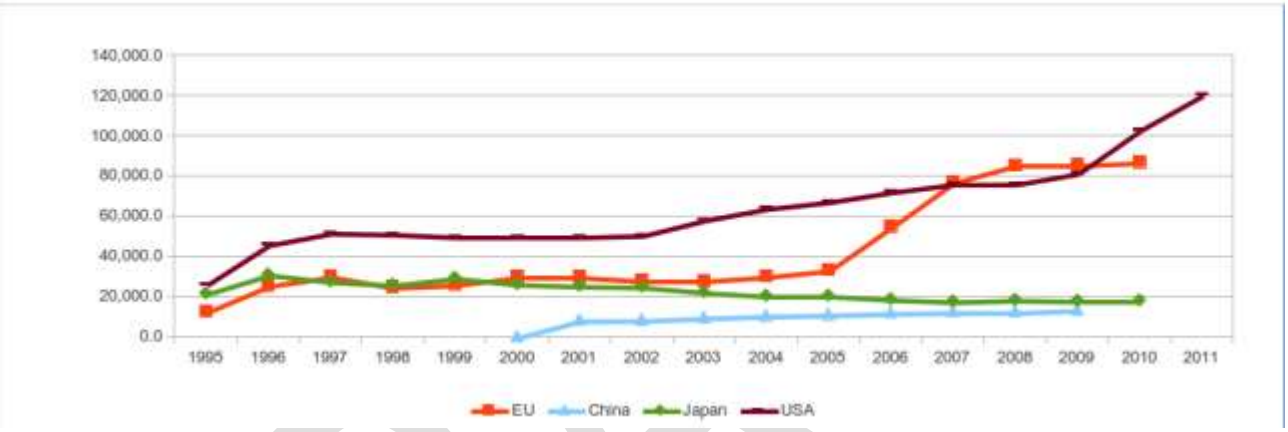
Agricultural subsidies are progressively moving away from support for production and towards incentives intended to reward farming practices that safeguard the environment (see Figure 3.1).[11] However, agri-environmental schemes are not always effective in achieving their aims in conserving biodiversity due to variable targeting[12]. Subsidies promoting biofuel use contributed to a four-fold increase in production of bioethanol and a tenfold increase in biodiesel production in the past decade, with some significant negative impacts on biodiversity (see figure 3.4).[13]

Incentives under the REDD+ (reducing emissions from deforestation and forest degradation) programme, focused on protecting forests to reduce carbon emissions, have the potential to bring considerable benefits to biodiversity. However, they could potentially have undesirable impacts if carbon storage is maximized at the cost of biodiversity (see Box 3.1). [14]

The most recent national reports to the CBD provide little evidence of actions to remove subsidies harmful to biodiversity. Much more emphasis is put on positive incentives for conservation and sustainable use of biodiversity for example through tax incentives to landowners who enter into contractual arrangements for formal protection of their lands (South Africa) and support for municipalities that formulate local biodiversity strategies (Japan). An example of using price incentives to encourage more sustainable use of fertilizers in India is given in Box 3.2.

Overall, progress towards this target shows a very mixed picture. While there is increasing recognition of the need to remove harmful subsidies, there is **limited action to phase them out and some backward steps in creating new ones**. The development and application of positive incentives, especially for agricultural practices that protect the environment, are **steps in the right direction, but not judged sufficient to meet this component of the target.**

A.



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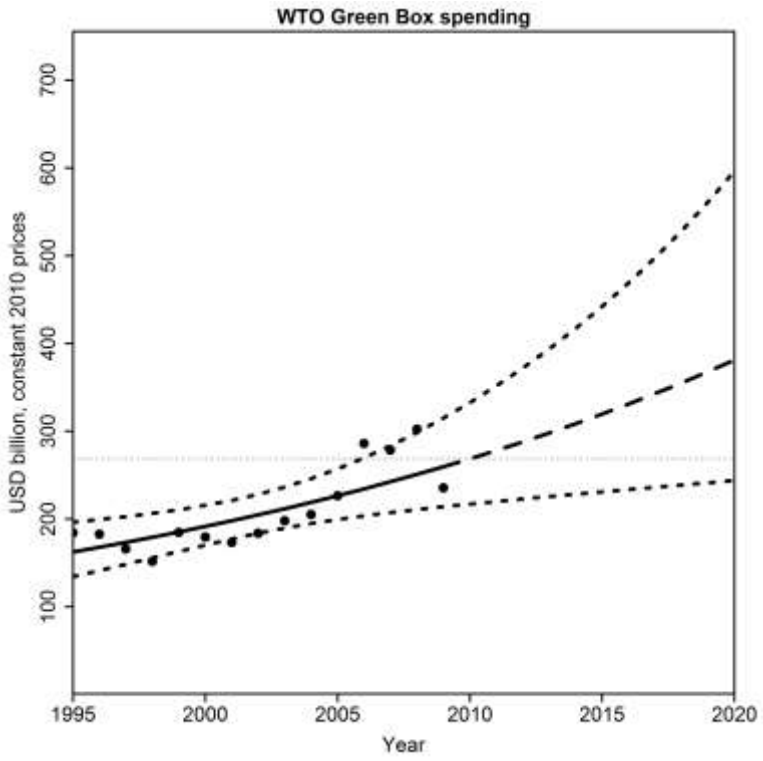
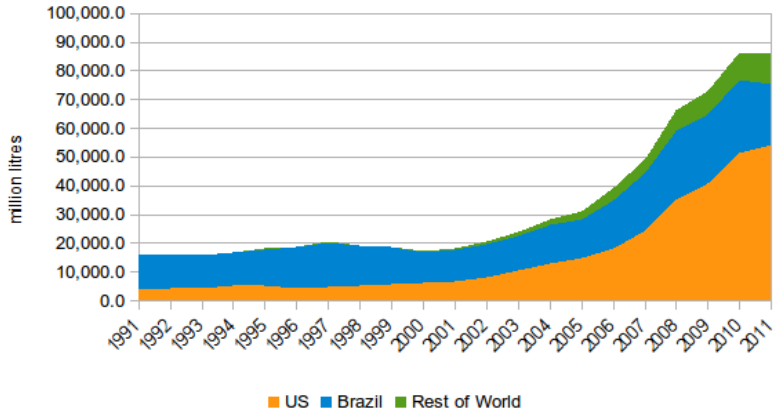


Figure 3.1 WTO 'green box' spending **A)** in US dollars (millions) from 1995-2011 to 2020, for the European Union, China, the United States and Japan, and **B)** extrapolations to 2020. 'Green box' refers to agricultural subsidies including environmental protection and regional development programmes that do not distort trade and do not involve price support. Long dashes represent extrapolation period. Short dashes represent 95% confidence bounds. Horizontal dashed grey line represents model-estimated 2010 value for the indicator. Extrapolation assumes underlying processes remain constant.
Source: WTO. Extrapolations: Derek Tittensoor 2014.

Actions to Enhance Progress Towards the Target:

The following actions would help to accelerate progress towards Target 3:

- Undertaking national, and, as appropriate, regional, analytical studies to identify candidate subsidies for elimination, phase-out or reform, as well as opportunities to promote the design and implementation of positive incentive measures;
- Developing policy plans, including a prioritized list of measures, with timelines, leading to the eventual removal, phase-out, or reform of harmful subsidies and the introduction, or strengthening, of positive incentives for the conservation and sustainable use of biodiversity;
- In cases where candidates for elimination, phase-out or reform are already known, taking immediate policy action;
- Making greater use of social incentives (for example, the establishment of awards or recognition programmes promoting behaviours beneficial to biodiversity).
- Better targeting of agri-environmental schemes towards desired biodiversity outcomes
- Removing or reforming bio-energy subsidies to take account of the full impacts of biofuel crops on both greenhouse gas emissions and biodiversity; and
- Designing REDD+ projects to create maximum benefits both for climate mitigation and for biodiversity conservation, and to avoid perverse outcomes for biodiversity (Box 3.1).



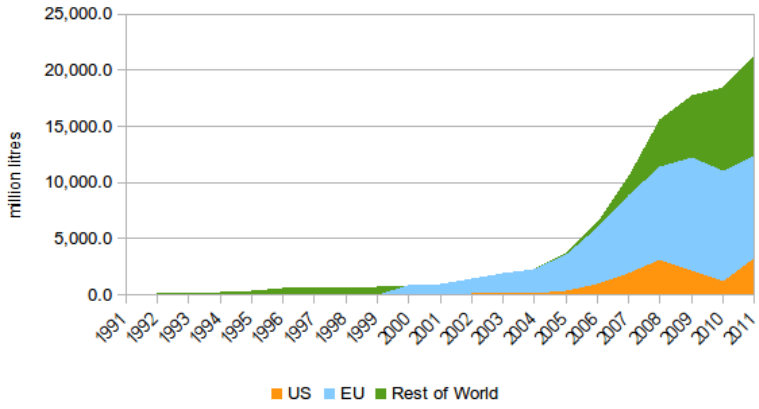


Figure 3.4. Development of **A)** bioethanol production and **B)** biodiesel production 1991-2011. The rapid increase in biofuel production has been stimulated by subsidies aimed at meeting targets for reducing dependence on fossil fuels. *Source: Earth Policy Institute, 2012*.

START Box 3.1: REDD+ and biodiversity

The REDD+[15] mechanism (reducing emissions from deforestation and forest degradation) was launched by the UN Framework Convention on Climate Change (UNFCCC) in 2007. Its scope includes the reduction of emissions from deforestation, reductions of emissions from forest degradation, the conservation of forest carbon stocks, the sustainable management of forests, and the enhancement of forest carbon stocks. At the end of 2011, total support to countries implementing UN-REDD programmes totalled US$ 108.1 million. By 2014, 18 countries were partners of UN-REDD, receiving support for national programmes, and a further 31 countries were receiving support. For the period 2011-2015, the aim of the UN-REDD Programme is to support countries in the development and implementation of their REDD+ strategies in order to speed up their REDD+ readiness. In November 2013, the BioCarbon Fund Initiative for Sustainable Forest Landscapes was launched at the UNFCCC COP19 in Warsaw, with funding pledges from Norway, the United Kingdom, the United States and Germany. Funding for the first year of this initiative will exceed US$ 280 million.

REDD+ programmes carry both opportunities and risks for biodiversity. Opportunities include slowing habitat loss (Target 5) and recovery of degraded forest ecosystems (Target 15), while risks include displacement of land use change to other ecosystems including savannas and grasslands, and afforestation or reforestation with non-native species or forests with low species diversity.

Sources: UN-REDD Programme, Miles et al. (2013)[16]

END of Box 3.1

Target 4: Sustainable Production and Consumption

By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

Why this target is important:

Underlying all the direct pressures on biodiversity is the unsustainable demand for natural resources generated by our present patterns of producing and consuming goods and services. With a rising human population and increasing per capita consumption, such pressures can only increase unless there is a determined effort to make production and consumption more sustainable. To meet the objective of keeping the impacts of natural resource use well within safe ecological limits, actions must address both the efficiency of using resources, and limiting total demand for goods and services.

Target elements (by 2020)	Status	Confidence
Governments, business and stakeholders at all levels have taken steps to achieve, or have implemented, plans for sustainable production and consumption…	Progress towards target but at an insufficient rate	High
… and have kept the impacts of use of natural resources well within safe ecological limits.	Moving away from target	High

Storyline (recent trends, current status and future projections):

While natural resources are being used much more efficiently to produce goods and services, this advance is overwhelmed by our greatly increased total levels of consumption. The intensity of resource use is expected to decrease further in the short term, due to efficiencies in production, especially in agriculture and forestry (see Figure 4.1). However, it is unlikely that maintaining current patterns of consumption can keep ecosystems within safe ecological limits by 2020.[17]

Humans are appropriating between 30 and 40 per cent of the entire planet's plant production, more than double the amount appropriated a century ago.[18] The ecological footprint of our societies continues to grow[19], and use of fresh water is rising unsustainably (see Figure 4.2).[20] Figure 4.1 shows that natural resource use per person, and per dollar of the economy, has become more efficient in recent decades, with the exception of water use. Overall use of resources is projected to continue to increase in absolute terms until 2020.

Urban populations account for a large portion of humanity's ecological footprint, and this is projected to increase further. Accounting for more than half the global population, cities account for around three quarters of the world's resource consumption. With the urban population forecast to double by 2050, new urban infrastructure will place huge demands on resources, and the decisions made by subnational governments and urban citizens therefore have great implications for the achievement of sustainable production and consumption (see Box 4.2).

GBO4 can report **progress towards part of this target, as steps are being taken in many areas to implement plans for more sustainable production and consumption, although not on a scale that would achieve this element of the target by 2020** (see for example Box 4.1 and certification schemes

under Target 7)**.** There is, however, ample evidence that **we are currently moving in the wrong direction regarding the objective of keeping the impacts of natural resource use within safe ecological limits, especially with regard to water use.**

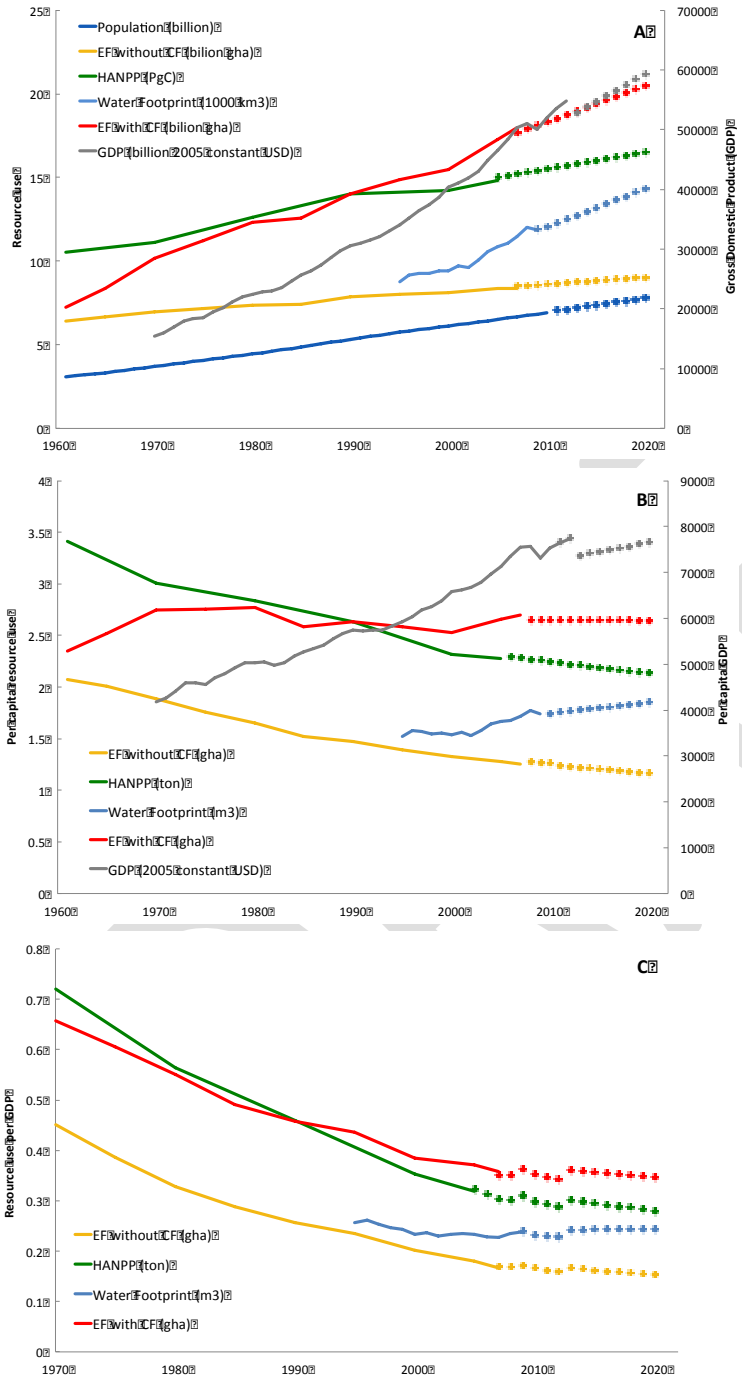


Fig 4.1. These graphs help to demonstrate that while all indicators of resource use are rising in absolute terms, the intensity of resource use is decreasing, measured both in terms of resources per person and resources per dollar of the economy. The exception is with water use, which is rising both in absolute terms and in intensity. **Key: A**) Extrapolations of currents trends of population, Gross Domestic Product (GDP), Ecological Footprint (with and without the Carbon Footprint component), Water Footprint and Human Appropriation of Net Primary Production; **B)** per capita extrapolations of current trends of GDP

(secondary axis), Ecological Footprint (with and without the Carbon Footprint component), Water Footprint and Human Appropriation of Net Primary Production, **C)** extrapolations of currents trends of intensity resource use of Ecological Footprint (with and without the Carbon Footprint component), Water Footprint and Human Appropriation of Net Primary Production intensities (resource use per unit GDP). Data sources: UN World Population Prospects (2013), UN National Accounts main aggregate database (2013); Global Footprint Network (2012); Krausmann et al. (2013); Arto et al. (2012). for GDP; Global Footprint Network (2012), for Ecological Footprint Data; Krausmann et al. (2013), for Human Appropriation of Net Primary Productivity; Arto et al. (2012), for Water Footprint.[21]

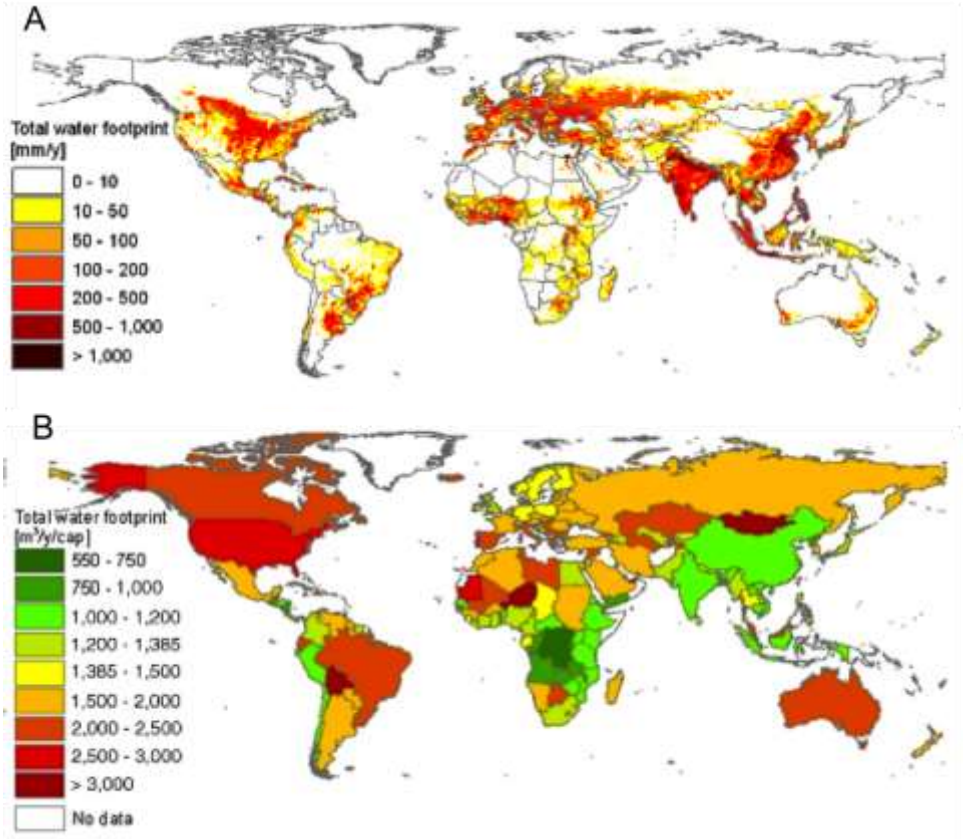


Figure 4.2 A) Global water footprint of production (mm/y on a 5'X5' grid), **B)** Global per capita water footprint of consumption (m3/y/cap). From Hoekstra and Mekonnen (2012)**.**

Actions to Enhance Progress Towards the Target:

The following actions would help to accelerate progress towards Target 4. They would also contribute to other targets, shown in parentheses:

- Promoting the inclusion of conservation and sustainable use in corporate sustainability plans;
- Strengthening partnerships among companies and industry associations, civil society and government agencies, in an accountable and transparent manner, to promote sustainable practices that address biodiversity;
- Developing incentives, regulations and guidelines to encourage business development in sustainable production and consumption;
- Encouraging companies to determine and disclose their biodiversity-related externalities (footprint);
- Establishing government sustainable procurement policies that are in line with the objectives of the CBD (see Box 4.1); and
- Developing sector specific sustainable production and consumption plans (*Targets 6 and 7*);

- Acknowledging the central role of subnational governments in achieving sustainable production and consumption, especially in relation to the ecological footprint of cities (see Box 4.2).

START Box 4.1: The European Union's Sustainable Timber Action programme:
According to the Worldwide Fund for Nature (WWF) in 2008, approximately 18% of all wood and related products imported by the European Union (EU) every year were from illegally logged timber. European public authorities buy approximately 15% of the total timber and paper sold. Starting in March 2013 the EU Timber Regulation (EUTR) makes it unlawful in the EU to import timber harvested illegally anywhere in the world. The establishment of procurement policies requiring governments to purchase only legal timber can be an effective way of excluding illegal timber from segments of a consumer country's market. The goal of Sustainable Timber Action (STA) is to use public procurement to increase awareness in Europe about the human and environmental issues caused by deforestation and forest degradation in developing countries, and about the impact of unsustainable consumption and production of forest products on climate change, biodiversity and people dependent on forests. STA has developed a toolkit for sustainable timber procurement, and has enabled the establishment of the European Sustainable Tropical Timber Coalition, a coalition of European local governments who aim to use public procurement to boost the market for sustainable tropical timber.
Sources: WWF, 2008b; STA, 2013; Brack and Buckrell, 2011
End Box 4.1

START Box 4.2 Urban biodiversity and the footprint of cities
Subnational governments have profound potential to influence the implementation of the Convention on Biological Diversity (CBD), and they typically account for much of the implementation by governments to address biodiversity loss.

Cities and metropolitan regions have unique features that make their role in subnational implementation of the CBD particularly important. Since 2007 the majority of the world's population has lived in cities[22], and urban people are responsible for about three quarters of the world's consumption of resources.[23] The 'top 600' cities alone account for more than half of the global GDP, and their dominance of global production is predicted to increase.[24] The global urban population as a whole is due to increase from 3.5 billion urban dwellers worldwide in 2010, to 6.3 billion in 2050. [25]The urban infrastructure required for this unprecedented increase is more than double the world's current infrastructure and, in order for us to reach this development target, we will need to build as much infrastructure as we have built over the past 4,000 years.[26]

With these formidable challenges to sustainability and biodiversity, come opportunities. Cities have the vast majority of the wealth, of knowledge institutions, of communication networks, and of direct contact with the populace. These factors allow city governments to affect rapid change. In cities the rapidly evolving phenomenon of citizen science and citizen contribution to data collection reaches its greatest potential. Meanwhile environmental impact assessments and similar studies by local governments generate invaluable high-resolution data, often in places where biodiversity loss is most severe. Some subnational governments, such as the State and City of São Paulo in Brazil have gone so far as to quantify their ecological footprint to determine their local effect on the global environment. [27]

Biodiversity and the ecosystem services that it underpins can also be of enormous benefit to cities, and this is increasingly recognized by urban governments and agencies. Urban trees have been shown to alleviate the heat island effect in cities; green areas have been shown to increase both the property value and the health of those living nearby; conservation of wetlands adjacent to cities and slums has been shown to protect these areas from flood risk.[28]

A growing number of organizations, governments and other institutions are recognizing that the mode of urbanization will determine the sustainability of not only cities but the planet as a whole.

END Box 4.2

Strategic Goal B.

Reduce the direct pressures on biodiversity and promote sustainable use.

It is only possible to reduce or halt the loss of biodiversity if the drivers and pressures on biodiversity are themselves reduced or eliminated. GBO4 is able to report only limited progress towards targets aimed at reducing the direct pressures on biodiversity. In some tropical regions there has been significant success in reducing previously high rates of deforestation, but habitats around the world continue to be destroyed, degraded and fragmented. Overfishing remains a major threat to marine ecosystems, although an increasing number of fisheries especially in the developed world are moving towards more sustainable management. Successes in limiting pollution from excessive use of nutrients in some regions are currently outweighed by rising nutrient pollution in parts of the developing world. Important progress has been made in identifying invasive alien species and the pathways by which they are spread, but this has not so far had an impact in reducing the actual number of invasions. The one target within this goal whose deadline was set at 2015, reducing multiple pressures on coral reefs, is certain to be missed.

Target 5: Habitat loss halved or reduced

By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

Why this target is important:

The destruction and degradation of natural habitats represents the single most important driver of biodiversity loss.[29] Economic, demographic and social pressures are likely to lead to continued conversion of habitats, but reducing the rate of that loss is critical to implementing the Strategic Plan. Preventing further fragmentation of habitats is also essential to avoid species populations becoming isolated and to enable essential movements across landscapes and aquatic environments, especially important in the face of climate change.

Summary of progress towards the target:

Target elements (by 2020)	Status	Confidence
The rate of loss of forests is at least halved and where feasible brought close to zero	Progress towards target but at an insufficient rate	Low
The loss of all habitats is at least halved and where feasible brought close to zero	No significant progress	Medium
Degradation and fragmentation are significantly reduced	Moving away from target	Medium

Storyline (recent trends, current status and future projections):

The loss of forest habitats in some regions, for example the Brazilian Amazon, has significantly slowed in recent years, through a combination of policies targeting multiple drivers of deforestation. However, deforestation in many other tropical areas of the world is still increasing (see figure 5.1).[30] Deforestation in southeast Asia is mainly attributed to large-scale agro-industry, especially oil palm plantations, while in other areas increased demand for land for local food production is a major driver.[31]

Although halting deforestation carries costs in terms of lost opportunities for example in agriculture and logging, these are far outweighed by the benefits from the value of ecosystem services provided by forests (see Box 5.1).

While data are scarce for other terrestrial habitats, grasslands and savannas continue to witness large-scale conversion to intensive agricultural and other uses.[32] The total area of land remaining in natural or semi-natural conditions has shown a downward trend in recent decades and would decline further by 2020 if recent trends continue (see Figure 5.2).[33] Coastal habitats such as mangroves continue to be lost through activities such as aquaculture, land reclamation and urban development, but global trends are difficult to discern due to variable data.[34]

Habitats of all types, including forests, grasslands, wetlands and river systems, continue to be fragmented and degraded (see Figure 5.3).[35] While there is a trend towards removing small dams in some industrialized countries, rates of new large dam construction are increasing rapidly in South America, Asia and Africa, threatening further fragmentation of freshwater habitats.[36]

Most countries have set national targets relating to habitat loss, although few specify the scale of reduction being sought. About one-third of the national reports analysed for GBO4 suggest that progress is being made on reducing loss of habitats. Less information is available regarding national action to reduce fragmentation and degradation.[37]

Overall, while GBO4 can report **limited progress towards this target with respect to tropical forests in some regions**, indicators suggest a **highly variable picture in different parts of the world and among different biomes**, with data still scarce for many types of ecosystem.

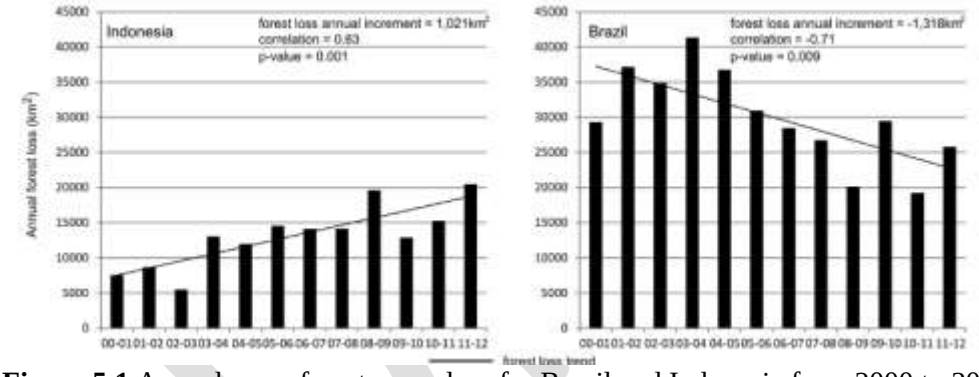


Figure 5.1 Annual gross forest cover loss for Brazil and Indonesia from 2000 to 2012. (Hansen *et al.*, 2013)

Actions to Enhance Progress Towards the Target:

The following actions would help to accelerate progress towards Target 5. They would also contribute to other targets, shown in parentheses:

- Identifying at the national level the direct and indirect causes of habitat loss with the greatest impact on biodiversity, to inform policies and measures to reduce loss;
- Developing a clear legal or policy framework for land use or spatial planning that reflects national biodiversity objectives (*Target 2*);
- Aligning existing incentives to national objectives for land use and spatial planning, and, the use of further incentives to reduce habitat loss, degradation and fragmentation, including as appropriate, payments for ecosystem services and REDD+ (*Target 3 – see Box 3.2*);

- Facilitating a sustainable increase in the productivity of existing agricultural land and rangeland, within a land use or spatial planning framework, with a view to reducing the demand for conversion of natural habitats (*Target 7)*
- Engaging with indigenous and local communities, landowners, other stakeholders and the general public in activities to reduce illegal and unplanned land use change, and for commodity supply chains (including distributors, buyers and financiers) to restrict products produced from illegally sourced commodities and illegally cleared land (*Targets 1, 4 & 18*);
- Developing protected area networks (*Target 11*); and
- 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 (*Target 19*);

START Box 5.1: Economic benefits from avoiding deforestation

Halting deforestation may result in missed benefits. These opportunity costs of forest conservation vary widely, according to the returns from alternative land uses (Table 5.1; Grieg-Gran, 2008).

However the benefits obtained by reduced deforestation outweigh the costs. For example reducing deforestation rates has been estimated to result in an annual benefit of US$183 billion, due to the high values of ecosystem services provided by forests (HLP2). For the Amazon, WWF estimated the benefits obtained by ecosystem service per hectare of forest (Table 5.2; WWF, 2009). One of those ecosystem services is carbon storage, on a carbon market this could potentially lead to an economic value of US$ 750 – 10000 / ha. Also, non-timber forest products are an important contribution of household incomes in many Asian countries. In Southern Asia, the economic benefits of non-timber forest products are estimated at US$ 1 000 - 6 000/ ha/yr. For forest dependent communities these benefits generally constitute 50-80% of average annual household income (HLP2). Notably, indigenous peoples and other forest-dependent communities gain a range of other non-economic benefits from forests, including food security, health security through access to traditional medicines, non-timber forest products for subsistence, fodder and building materials, among others.

Table 5.1. Estimated Net Present Values in US$/yr/ha (Eliasch review, 2008)

Brazil	**Indonesia**	**Cameroon**
Soybeans: 3,275	Large scale palm oil: 3,340	Cocoa with marketed fruit: 1,448
Beef cattle (medium/large scale): 413	One-off timber harvesting: 1,099	Annual food crop, short fallow: 821
One-off timber harvesting: 251	Smallholder rubber: 72	Annual food crop, long fallow: 367
Beef cattle (small scale): 3	Rice fallow: 28	

END Box 5.1

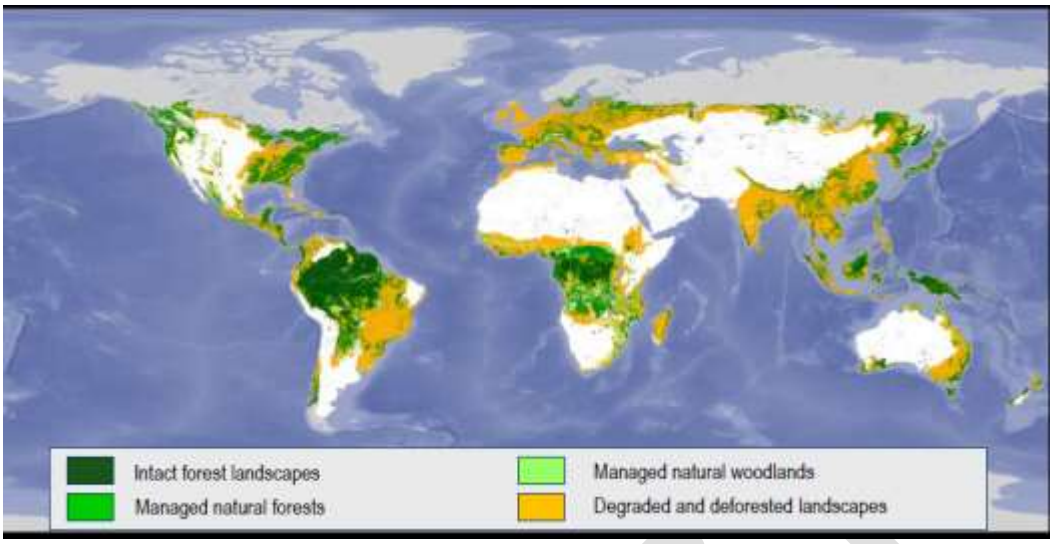


Figure 5.3 The extent of deforestation and forest degradation worldwide. Source: World Resources Institute (2012).38

START Box 5.2- Pathways for reductions in habitat loss:

Between the end of the 20th century and 2004 the Brazilian Amazon and Atlantic Forest had very high and rapidly rising deforestation rates. However with the use of a broad range of actions, corresponding to the Aichi Targets and Strategic Goals, deforestation rates have been greatly reduced. (See figure 5).

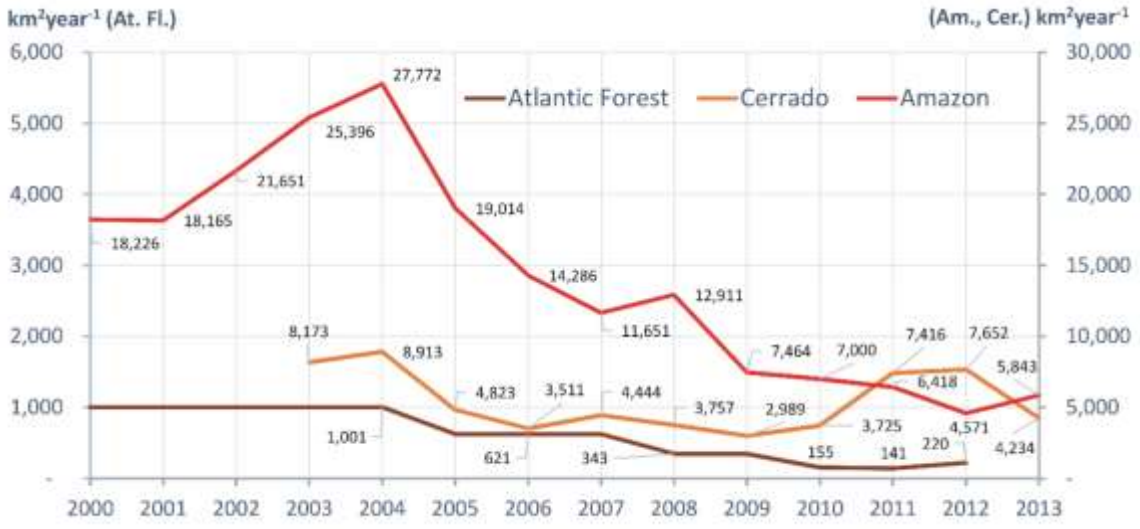


Figure 21.5. Deforestation trajectories in Brazil's major biomes. Recent efforts have reduced Amazon deforestation in 2013 by 70% below the historical 1996-2005 baseline of 19,600 km^2 $year^{-1}$. Deforestation has also steadily declined in the Atlantic Forest despite a slight increase in 2013. Deforestation in the Cerrado has remained high.

The rapid decline in deforestation in the Brazilian Amazon and Atlantic Forest are the result of a wide range of interrelated public and private policy initiatives, coordinated through the Action Plan for the Prevention and Control of Deforestation in the Amazon (BMMA 2013) launched in 2004. The action plan was a cross-ministry initiative, coordinated by the President's office. It includes a number of activities

that relate to a number of Aichi Biodiversity Targets across all of the Strategic Goals, as indicated in the list below.

- Monitoring of land-cover (*Target 19*): both near real time coarse resolution and annual high resolution satellite monitoring. The information generated through this monitoring was made publicly available
- Enforcement campaigns by Brazil's environmental agency to crack down on illegal deforestation and logging Interventions informed by the near-real time monitoring. Businesses and stakeholders have also implemented plans to reduce deforestation to within safe limits.
- Incentive measures (*Target 3*) - restricting credit for rural landowners in with the highest rates of deforestation.
- Expansion of protected areas and demarcation of indigenous lands[39],[40] (*Targets 11, 18*). Approximately 40% of natural vegetation is legally protected by parks and indigenous reserves. From 2002 to 2009, the Brazilian Amazon Protected Area network expanded by 60%; a large part of these news areas were created in regions of intense land conflict to act as green barriers against deforestation, establishing a new protected area paradigm[41].

In addition, as people have become more aware of the values of biodiversity (*Target 1*), NGO and business initiatives have implemented moratoria on soy and meat produced on recently-cleared land. Public prosecutors have also acted to require the industry to exclude deforesters from their supply chains. (*Target 4*).

Action to control deforestation, and also to require restoration, takes place in the framework of the Law of Native Vegetation Protection (LNVP) — previously known as Brazil's Forest Code — which requires the maintenance of sensitive areas such as riversides, hilltops and slopes as well as a certain proportion of private property under native vegetation.

By combining these different approaches the government of Brazil was able to address both the underlying and direct causes of habitat loss and bring about positive change. However despite the progress that has been made in reducing deforestation Brazilian Amazon and Atlantic Forest challenges remain including balancing competing demands for expanding agricultural production and enforcing forest conservation. This is particularly the case for the Cerrado biome where, unlike the Amazon and Atlantic forests, deforestation rates remain high[42]. Conversion of Cerrado vegetation has occurred over 50% of the biome and continues at a rate of 5000 km2year-1 (average for 2003-2013)[43].

END of Box

Target 6: Sustainable management of marine living resources

By 2020, all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

Why this target is important:

Overexploitation of fish and other marine organisms is the main threat to the biodiversity of the world's oceans. Unsustainable harvesting threatens not just the marine ecosystems themselves, but the profitability of fishing businesses around the world and the livelihoods of millions dependent on the resources of the ocean. Finding and applying management approaches that avoid overfishing and that enable stocks to recover are therefore essential elements in a strategy to conserve and sustainably use biodiversity.

Summary of progress towards the target:

Target elements (by 2020)	Status	Confidence
All fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches	Progress towards target but at an insufficient rate	High
Recovery plans and measures are in place for all depleted species	Progress towards target but at an insufficient rate	High
Fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems	No overall progress	Medium
The impacts of fisheries on stocks, species and ecosystems are within safe ecological limits, i.e. overfishing avoided	No overall progress	Medium

Storyline (current status and trends):

Overfishing continues to be a major problem, with an increasing percentage of fish stocks overexploited, depleted or collapsed (see Figure 6.1a).[44] Persistent overfishing has a severe impact on marine biodiversity, driving the collapse and local extinction of several species, and reducing the total biomass of predator fish species by more than half (52 per cent) between 1970 and 2000.[45] Destructive fishing practices such as bottom trawling continue to cause damage to vulnerable habitats such as coral reefs, seagrasses, cold water corals and sponge grounds.[46] Unselective gear results in the capture of large quantities of non-targeted species (bycatch), estimated at some 40% of total global catch, and including over 600,000 marine mammals and 85,000 turtles a year, with serious consequences for the conservation of some species.[47]

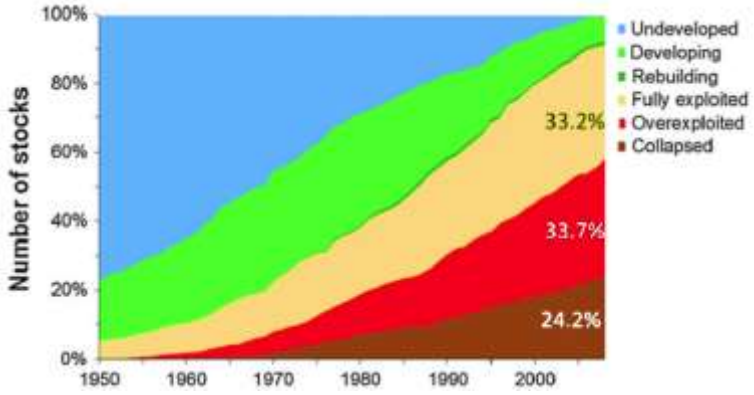
On the positive side, in some regions where exploitation rates have been significantly reduced, depleted stocks have rebounded, as in the case of the Northeast Atlantic (see Box 6.1). There has also been a marked trend towards certification of sustainably-managed fisheries: the number of fisheries certified by the Marine Stewardship Council (MSC) increased by more than 400 per cent from 2008-13, now accounting for some 9% of wild fisheries. However, MSC-certified fisheries are concentrated in developed countries (see Figure 6.2).[48]

Management systems such as Individual Transferable Quotas (ITQ) that give fishing businesses a stake in the long-term health of fish stocks, can be effective in improving catch trends, but they need to be designed carefully to avoid unwanted socio-economic impacts.[49] Co-management of fisheries involving local communities help to give legitimacy to fishery regulations, and especially in small-scale fisheries in developing countries can lead to successful outcomes (see Box 6.2).

National action in the form of periodic freshwater fishing bans (Mongolia), fisheries management plans (Niue) and sustainable seafood initiatives (South Africa) are among the measures included in the latest reports from CBD Parties. However, around half of these reports include information suggesting that the scale of overfishing is either constant or getting worse.[50]

Overall, based on current trends, **the proportion of fish stocks within safe ecological limits is projected to decline at least until 2020** (see Figure 6.1b), and **some progress towards sustainable management and stock recovery** is overwhelmed by **continuing destructive practices in fishing worldwide. Significant changes in policy and practice are therefore required if this target is to be met.**

A.



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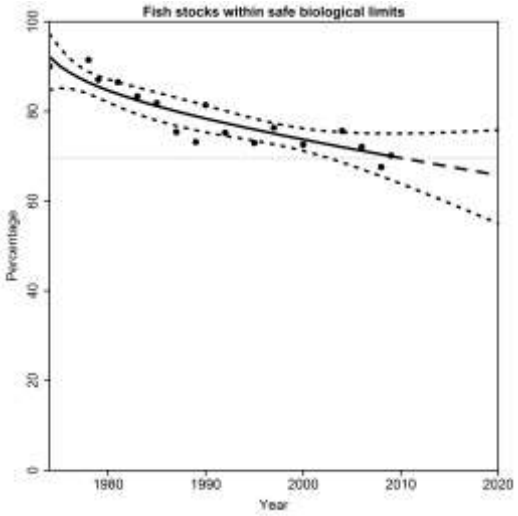


Figure 6.1: A) Historical status of fish stocks (1950- 2008) and **B)** proportion of fish stocks within safe biological limits, with extrapolation to 2020 assuming underlying processes remain constant. Long dashes represent the model projection for the extrapolation period. Short dashes represent 95% statistical confidence bounds for the modelled trend and extrapolations. Black dots represent data points. The horizontal dashed grey line is the model-estimated 2010 value for the indicator. *Source: Froese et al. 2012, Sea Around Us Project database.*[51]

Actions to Enhance Progress Towards the Target:

The following actions would help to accelerate progress towards Target 6. They would also contribute to other targets, shown in parentheses:

- Promoting and enabling dialogue and enhanced cooperation and information exchange between fishing and conservation communities and the corresponding national agencies and associations;
- Making greater use of innovative fisheries management systems, such as community co-management, that provide fishers and local communities with a greater stake in the long-term health of fish stocks (*Target 18*);
- Eliminating, reforming or phasing out those subsidies which are contributing to excess fishing capacity (*Target 3*);
- Enhancing, in each country, monitoring and enforcement of regulations to prevent illegal, unregulated and unreported fishing by flag-vessels;
- Phasing out fishing practices and gear which cause serious adverse impacts to the seafloor or non-target species; and
- Further developing marine protected area networks, including the protection of areas particularly important for fisheries, such as spawning grounds, and vulnerable areas (*Targets 10 and 11*).

START Box 6.1: Moves towards sustainability in NE Atlantic fisheries

From the late 19th Century, the United Kingdom led development of industrialized fisheries, with the consequence that fisheries around the British Isles were severely overexploited by the late 20th Century. This situation is changing throughout the northeast Atlantic, including around the UK, where the proportion of fish stocks that are being harvested sustainably and are at full reproductive capacity has shown an increasing trend since 1990 (Figure 1). This sustainability indicator reached a maximum in 2011, at 47% of the 15 stocks for which accurate time series are obtainable from stock assessment reports. Many of these indicator stocks are being fished at or below the rate that will provide long-term maximum sustainable yield (MSY). The benefits of a push towards sustainability can be seen in stocks for which long-term management plans based on the MSY principle have been applied. In the North Sea, for example, haddock, herring and Norway lobster are currently being fished with increased landings and incomes for fishermen and coastal communities. The proportion of fish stocks being harvested sustainably may further increase following reforms to the European Union's Common Fisheries Policy (CFP) which came to effect on 1st January 2014 and introduced a legally binding commitment to fish at sustainable levels, achieving MSY where possible, by 2020. These measures may help to buffer the adverse impacts of climate change and promote resilience within the marine ecosystem and fishing communities.

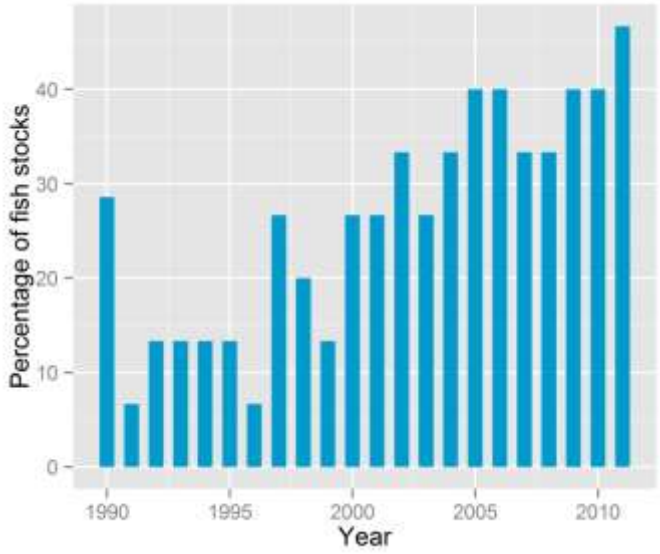


Figure 6.2. The percentage of UK fish stocks harvested sustainably and at full reproductive capacity, 1990 to 2011.*Sources: ICES, CEFAS*
Sources: Miranda Jones, CEFAS (Defra), ICES, European Commission.

End of Box 6.1

START Box 6.2. Community co-management of fisheries

Fisheries regulations need to be viewed as legitimate by stakeholders, in order to gain their support and compliance. Devolution of governance to indigenous peoples and local communities, shared governance, and co-management arrangements are a means to attain this legitimacy, and have contributed to successful fisheries management outcomes, especially in small-scale fisheries in developing countries. For example, coastal communities have demonstrated the ability to responsibly steward and manage marine ecosystems through a network of several hundred Locally Managed Marine Areas (LMMAs) in the South Pacific, as well as similar initiatives in Madagascar, Kenya, Spain, and Japan, among others.
Sources: Gutiérrez et al. 2011, Cinner et al. 2012[52]

End of Box 6.2

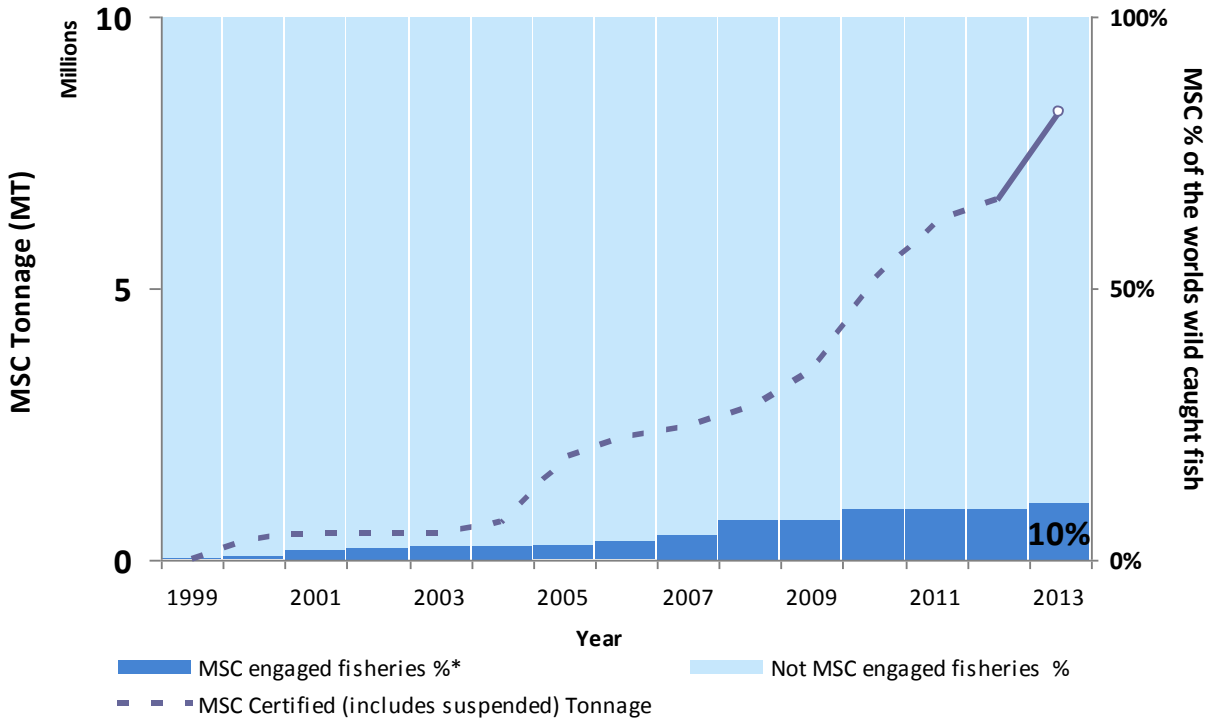


Figure 6.2. Trend in Marine Stewardship Council (MSC) certified fisheries. Source: MSC

Target 7: Sustainable agriculture, aquaculture and forestry

By 2020, areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

Why this target is important:

The increasing demand for food, fibre and fuel is putting ever-greater pressure on our ecosystems and biodiversity. To help ease that pressure, the key sectors of agriculture, aquaculture and forestry need to adopt practices that minimize negative impacts, making their activities more sustainable over the long term. This target challenges governments and businesses to define sustainable practices, and to show progress towards adopting them as widely as possible.

Summary of progress towards the target:

Target elements (by 2020)	Status	Confidence
Areas under agriculture are managed sustainably, ensuring conservation of biodiversity.	Progress towards target but at an insufficient rate	High
Areas under aquaculture are managed sustainably, ensuring conservation of biodiversity.	Progress towards target but at an insufficient rate	High
Areas under forestry are managed sustainably, ensuring conservation of biodiversity.	Progress towards target but at an insufficient rate	High

Storyline (recent trends, current status and future projections):

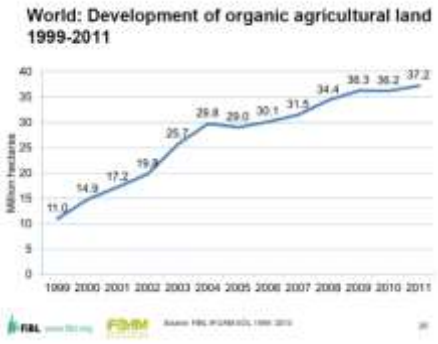
Unsustainable practices in agriculture, aquaculture and forestry continue to be responsible for substantial environmental degradation, including biodiversity loss.[53]

In agriculture, impacts of pollution from nutrients used as fertilizer remain high, but appear to be stabilizing in some regions (see Target 8). Indicators of farmland biodiversity, such as the condition of farmland bird populations in Europe, continue to decline, but projections indicate the trend will stabilize in the short term (see Figure 7.2).

The area covered by agricultural certification schemes, for example organic and conservation agriculture, is growing, but still covers a small proportion of farmed land (see Figure 7.1).[54] The area of forestry managed sustainably under the criteria of certification schemes continued to increase, but is still very strongly concentrated in temperate and boreal regions (see Figure 7.3).[55] While most national biodiversity strategies and action plans examined for GBO4 included targets or commitments relating to sustainable management of agriculture or forestry, few of these targets were quantitative.[56]

Aquaculture is expanding rapidly, with large environmental impacts, and a small but growing fraction of this activity is adopting sustainability criteria (see Box 7.1).[57]

Overall GBO4 can report **progress in introducing sustainable management to areas under agriculture, aquaculture and forestry, but not to the extent that would achieve this target given current trends.**



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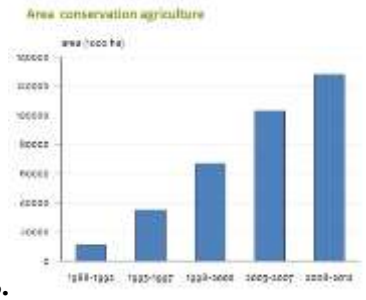


B.

Figure 7.1. Area of agricultural land under (a) organic production and (b) conservation agriculture. Source: IFOAM (2014), FAO (2013)

Actions to Enhance Progress Towards the Target:

The following actions would help to accelerate progress towards Target 7. They would also contribute to other targets, shown in parentheses:

- Increasing agricultural productivity in a sustainable way, including through improved targeting and efficiency of fertilizer, pesticide and water use (*Target 8)*, the use of diverse and well-adapted crop

varieties (*Target 13*) and the greater use and rehabilitation of ecological processes to replace chemical inputs and reduce water consumption ("ecological intensification");

- Promoting integrated landscape-level planning, taking into account the role of biodiversity in providing ecosystem services, including services that contribute to agricultural production such as pollination, pest control, water provision and erosion control (*Targets 5, and 14*);
- Reducing waste at all stages of production and consumption, including reducing post harvest losses and minimizing food waste (*Target 4*);
- Promoting sustainable diets, with appropriate caloric and nutrient intake, for example through the promotion of sustainable food cultures (*Target 4*);
- Making greater use of existing certification schemes for sustainably produced goods and the further development of certification schemes to fill current gaps;
- Facilitating customary sustainable use and, where appropriate, delegating governance and responsibility for land management to indigenous and local communities (*Target 18*).

START Box 7.1: Minimising negative impacts from aquaculture

Aquaculture, the farming of fish and other aquatic species, is forecast to account for an increasing proportion of food production in coming decades. Following sustainability guidelines can significantly reduce its negative impacts on biodiversity, including:

- Giving priority to farming native species and species lower down the food chain (e.g. herbivorous fish rather than carnivores). This can be achieved through a combination of regulations and promoting changes in consumer preferences;
- Minimizing pollution by improving management practices, for example by reducing overfeeding;
- Adopting practices such as 'multitrophic aquaculture' in which seaweed can be produced for human food, fish feed and pharmaceuticals, reducing feed demand and pollution;
- Using waste from one species to be converted to protein by another species, thereby reducing nutrient pollution;
- Adopting enclosed systems and better waste treatment, also reducing pollution;
- Minimizing the modification of habitats, especially in mangroves, maintaining ecosystem services and preserving nursery habitat for many commercially-important wild marine species.

Sources; FAO Code of Conduct for Responsible Fisheries and Ecosystem Approach to Aquaculture; CBD Ad Hoc Technical Expert Group on Mariculture.[58]

END of Box 7.1

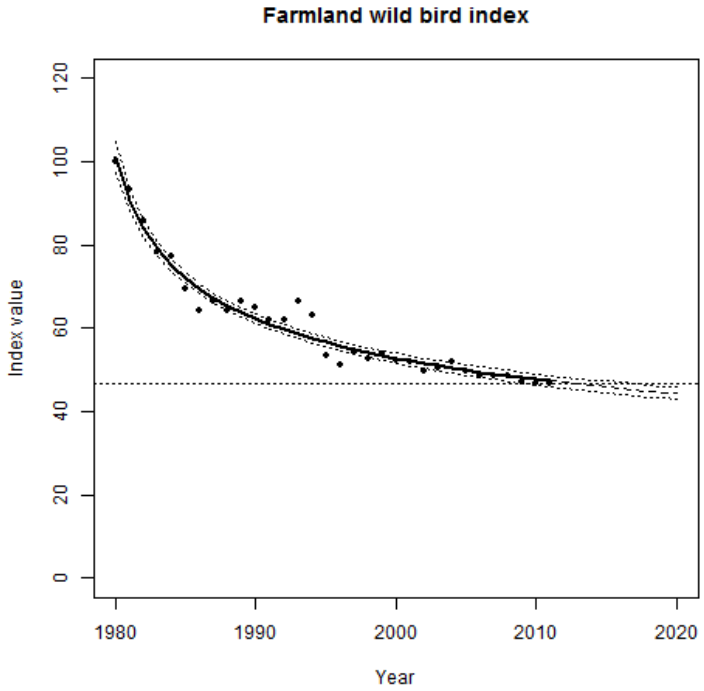


Figure 7.2. Trend in the Wild Bird Index for common farmland birds in Europe, 1980-2011 with statistical extrapolation 2011-20 assuming underlying pressures remain constant. It suggests a continuing decline in the status of these species populations but the rate of decline may be slowing. The solid black line represents the model fit for the period with data. Long dashes represent the model projection for the extrapolation period. Short dashes represent 95% statistical confidence bounds for the modelled trend and extrapolations. Black dots represent data points. *Source: EEA/EBCC, Tittensor et al.*

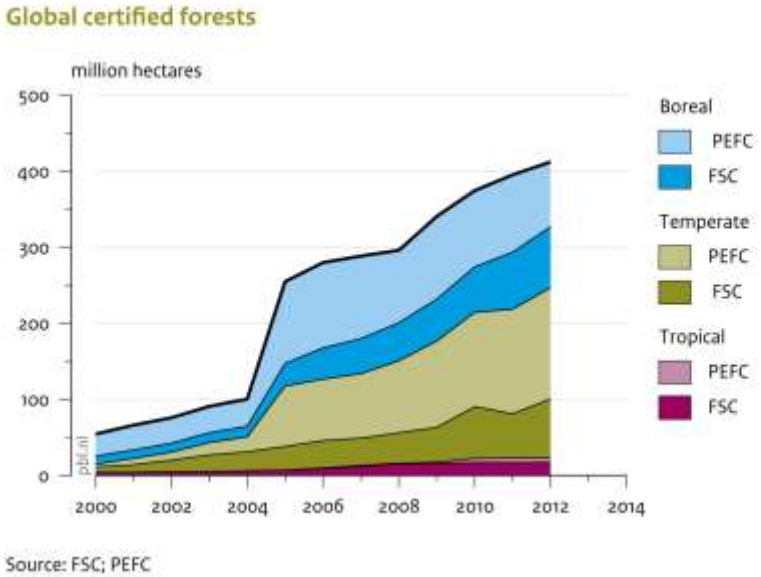


Figure 7.3. Total area of forestry under the Forest Stewardship Council (FSC) and Programme for the Endorsement of Forest Certification (PEFC) schemes in boreal, temperate and tropical regions *Source: FSC 2013, PEFC 2013*

Target 8: Pollution reduced

By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

Why this target is important:

Pollution, in particular the accumulation of reactive nitrogen and phosphorous nutrients in the environment, is among the most significant causes of biodiversity loss and of damage to the ecosystems on which we depend. Wetland, coastal, marine and dryland areas are especially vulnerable, through a range of impacts including the creation of marine 'dead zones' as algae build up and whole areas are deprived of oxygen. The target encourages decision makers to take the necessary action minimizing the release of these and other pollutants.

Summary of progress towards the target:

Target elements (by 2020)	Status	Confidence
Pollutants (of all types) has been brought to levels that are not detrimental to ecosystem function and biodiversity.	No clear evaluation – highly variable between pollutants	Low
Pollution from excess nutrients has been brought to levels that are not detrimental to ecosystem function and biodiversity.	Moving away from the target	High

Storyline (recent trends, current status and future projections):

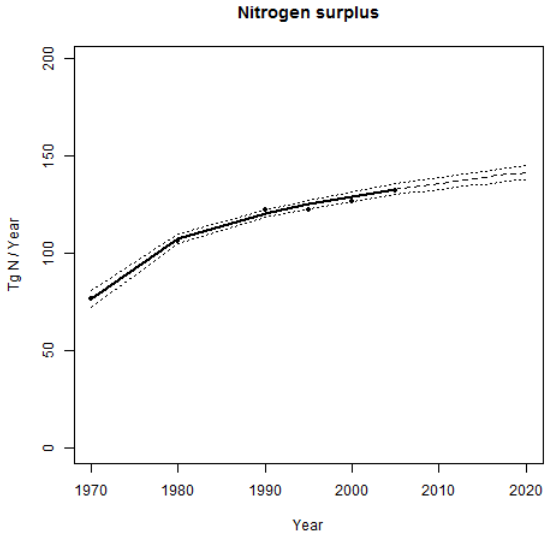
Nitrogen and phosphorous pollution continues to pose a very significant threat to biodiversity and ecosystem services globally.[59] Measures taken in some regions to limit release of nutrients to the environment have caused a stabilization of nutrient pollution, especially in Europe and North America, but at levels that are still detrimental to biodiversity (see box 8.1). Globally, the surplus of nitrogen and phosphorous in the environment is projected to continue rising beyond 2020, with growth concentrated in Asia, South and Central America, and sub-Saharan Africa (see figures 8.1, 8.2).[60]

Some toxic contaminants of wildlife in the Arctic are declining, apparently due to successful international action to restrict their use, but other existing and newly-developed contaminants are still widely used (see box 8.2)[61]. Other pollutants of continuing concern include plastics, in particular their impacts on marine ecosystems;[62] and pesticides, which have been implicated by some studies in damage to pollinating insect populations.[63]

Overall, damage from marine oil spills has declined dramatically, due to better tanker design and improved navigation, but pollution from pipelines, mainly land-based, has increased due to ageing infrastructure.[64]

Most national reports analysed for GBO4 indicate that countries are making progress towards achieving this target, with measures including reduction in the use of pesticides (Belgium) and putting pollution monitoring systems in place (Myanmar). [65] However, the overall evaluation is that **current trends are moving us further away from the target of bringing excess nutrients to levels not detrimental to ecosystem function and biodiversity.** It was not possible to evaluate overall trends regarding other forms of pollutants, due to limited information.

A.



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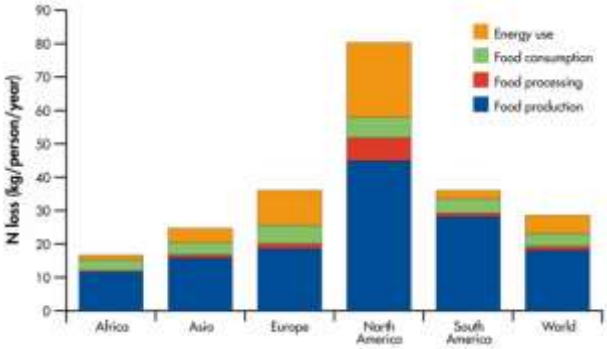


Figure 8.1. A) The global surplus of nitrogen in the environment, since 1970 and with statistical extrapolations from 2010-2020, assuming underlying processes remain constant. (source tbc, Tettinsor et al 2014) and **B)** the average loss of reactive nitrogen to the environment per inhabitant per continent, (INI, 2014). For the extrapolation, solid black line represents the model fit for the period with data. Long dashes represent the model projection for the extrapolation period. Short dashes represent 95% statistical confidence bounds for the modelled trend and extrapolations. Black dots represent data points. The horizontal dashed grey line is the model-estimated 2010 value for the indicator.

Actions to Enhance Progress Towards the Target:

The following actions would help to accelerate progress towards Target 8. They would also contribute to other targets, shown in parentheses:

- Developing and enforcing national water quality guidelines and/or concentration thresholds for different pollutants;
- Improving fertilizer use efficiency and promoting other sustainable agricultural practices including recycling of nitrogen from animal manures (*Target 7*);
- Eliminating phosphates from detergents;
- Enhancing treatment and recycling of sewage and industrial waste water
- Conserving and restoring wetlands and other ecosystems which play an essential role in nutrient cycling (Targets 5,11, 14 and 15); and

- Promoting the reuse and recycling of plastics, and the use of biodegradable alternatives, to reduce marine debris.

START Box 8.1: European nitrogen legislation.

The European Union's legislation to reduce nitrogen (N) loading consists of actions to reduce atmospheric deposition and leaching of nutrients into the aquatic environment. The three most important pieces of EU legislation for reducing nitrogen loading to ecosystems are:

- The Nitrates Directive which caps the total application of N from animal manures to 170 kg N/ha and restricts application of manure and inorganic fertilizer in situations with high risk of N loss.
- The National Emissions Ceilings Directive which caps emissions of ammonia and nitric oxide at national levels to reduce acidification and eutrophication. This directive also defines best management practices to reduce ammonia losses.
- The Urban Waste Water Treatment Directive which sets targets for efficient removal of nitrogen.

Due to these and other regulations, ammonia emissions in the European Union declined 30% between 1980 and 2011 On average, the gross nitrogen balance (an indicator of losses to the environment) decreased by 36 per cent between 1980 and 2005. Emissions reduction effects of the NECD and Nitrates Directive after the year 2000 were small. However, individual EU member states including Denmark, Belgium and the Netherlands with strict national nitrate and ammonia policies prompted by serious N pollution problems from intensive agriculture, achieved higher reduction of ecosystem loadings. Nevertheless, levels generally remain well above those that cause ecological damage and total nitrogen loads to EU rivers have remained relatively high and stable since 1990, despite substantial improvements for some rivers including the Rhine.

For sources see endnotes.[66]

End of Box 8.1:

START Box 8.2: Pollutants in Arctic biodiversity

International agreements on toxic substances have made significant contributions in some pollutant reductions, as certain legacy chemicals have diminished in some Arctic wildlife populations. The Stockholm Convention on Persistent Organic Pollutants is often credited as a driving force behind lower levels of legacy persistent organic pollutants (POPs) in species, but levels can still remain high enough in some species, such as polar bear and some seabirds, to affect wildlife and human health.

Continued use of existing pollutants and emerging new ones pose complex problems for species in the Arctic, an area of the world where ocean and atmospheric currents result in a high deposit and accumulation of substances. A variety of recently emerging, but poorly studied, contaminants, such as polybrominated diphenyl ethers (PBDEs), are increasing. In addition, mercury concentrations are increasing in parts of the Arctic, including areas in Canada and Greenland, and remain a concern, especially for top predator species. Further complicating the issue is the unpredictable interaction between contaminants and climate change, and the largely unknown sensitivities of Arctic species to contaminants.

Source: Arctic Biodiversity Assessment[67]

End of Box 8.2

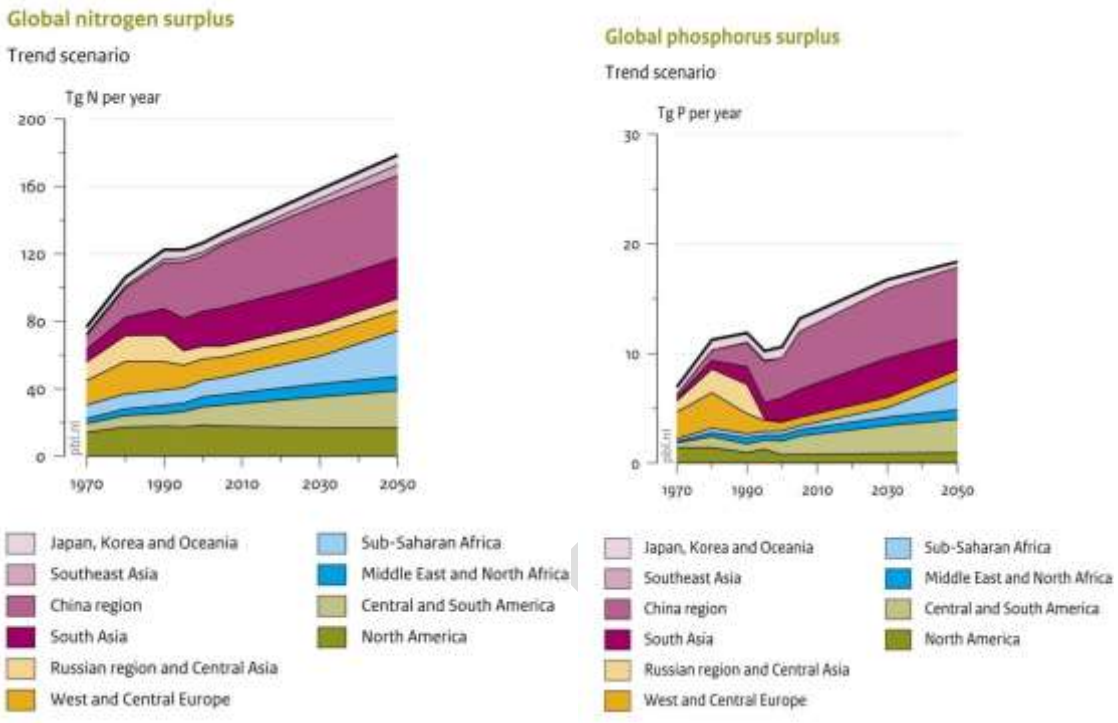


Figure 8.2. Global nitrogen and phosphorous pollution per region, following the Rio + 20 'baseline'(business as usual) scenario to 2050. Source: PBL (2012).

Target 9: Invasive alien species prevented and controlled

By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated and measures are in place to manage pathways to prevent their introduction and establishment.

Why this target is important:

The movement of animals, plants and other organisms around the planet represents one of the greatest threats to the diversity of life on Earth. Species introduced into new environments, whether deliberately or accidentally, have contributed to more than half of known animal extinctions. Species invasions also carry enormous economic costs, with the damage estimated at between two and five per cent of global GDP. Through this target, governments aim to reduce these costs to society and to biodiversity, by addressing prevention, control and eradication of invasive alien species.

Summary of progress towards the target:

Target elements (by 2020)	Status	Confidence
Invasive alien species identified and prioritized	Progress towards target but at an insufficient rate	High
Pathways identified and prioritized	Progress towards target but at an insufficient rate	High
Priority species controlled or eradicated	Progress towards target but at an insufficient rate	Low

Introduction and establishment of IAS prevented	No significant change	Medium

Storyline (recent trends, current status and future projections):

Governments are increasingly taking steps to prevent, control and eradicate alien species invasions. More than half (55 per cent) of the Parties to the CBD currently have national policies relevant to tackling this major threat to biodiversity.[68]

Where undertaken, measures to combat invasive alien species have often had striking success, for example in New Zealand where policies are starting to turn the tide against centuries of species invasions (see Box 9.1). Eradication programmes for invasive vertebrates on islands have been especially successful, with 87 per cent of such campaigns achieving their objective (see Figure 9.2). On the other hand, very few programmes to eradicate invasive species from mainland areas have succeeded.[69]

Progress has been made in identifying the pathways through which both terrestrial and aquatic species enter alien environments and become invasive (see Figure 9.2).[70] However, weak border controls in many countries prevent this knowledge from being acted upon.[71]

Around half of the national reports assessed for this Outlook suggest that progress is being made towards this target, but the reports suggest that actions tend to be concentrated on control and eradication, with relatively few examples of action to identify, prioritize and manage pathways of introduction.[72]

Cost-effective strategies are starting to be implemented to prioritize control and eradication of invasive alien species. Nevertheless, the efforts taken so far are still overwhelmed by the rate of alien species introductions, which shows no sign of slowing globally (see Figure 9.1).[73] Longer-term, climate change is likely to have a significant impact on the distribution of invasive alien species in different regions (See Figure 9.4).[74]

Overall, GBO4 can report **progress towards achieving Target 9 but additional actions are required if the 2020 deadline is to be met.**

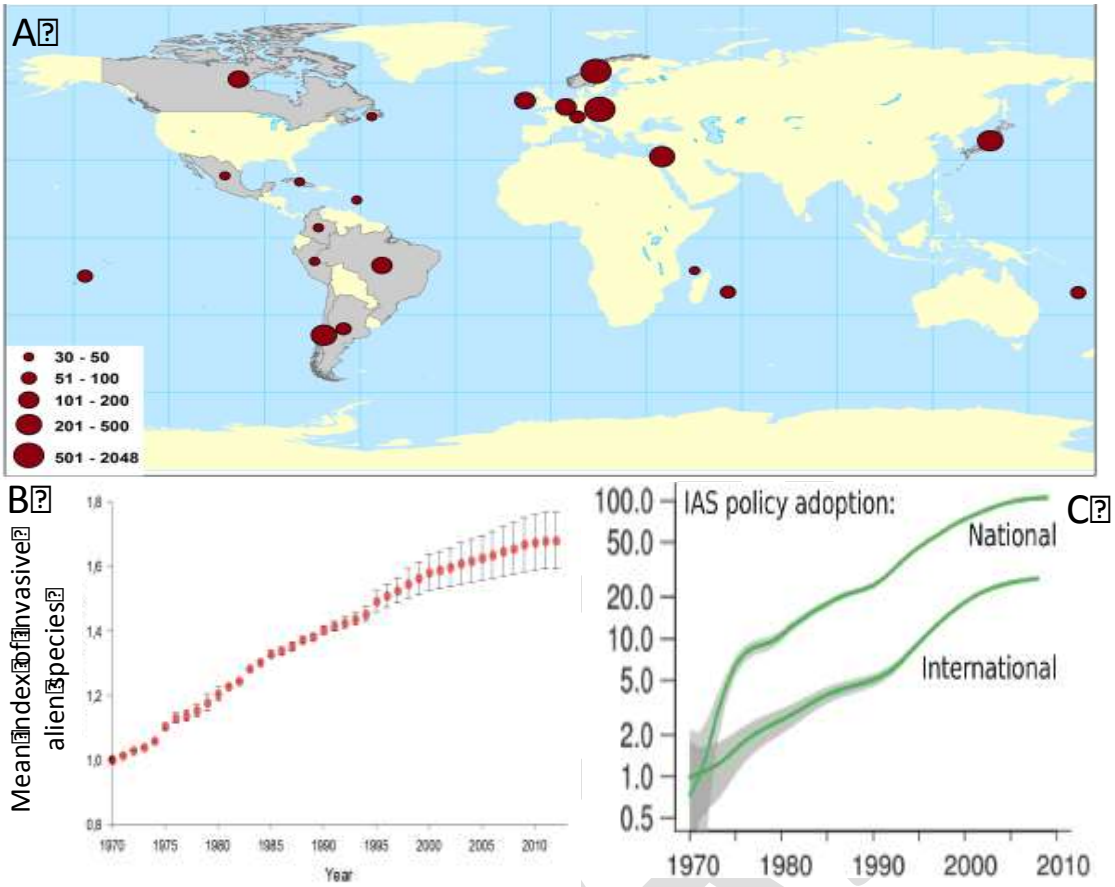


Figure 9.1. A. cumulative number of species introductions with known introduction dates, across 21 selected countries **B.** Trend indicator showing geometric mean of cumulative number of invasive alien species across 21 selected countries (1970=1); and **C.** Indicator of trend for adoption by countries of policies in response to invasive alien species Sources: Pragad et al. (2014), Butchart et al. (2010)

Actions to Enhance Progress Towards the Target:

The following actions would help to accelerate progress towards Target 9. They would also contribute to other targets, shown in parentheses:

- Raising awareness among policy makers, the general public and potential importers of alien species, of the impacts of invasive alien species, including the possible socio-economic costs and the benefits of taking action to prevent their introduction or to mitigate their impacts, including by publicizing nationally relevant case studies (*Target 1*);
- Developing lists of alien species known to be invasive (or assessing existing lists for their completeness and accuracy) and making them widely available (*Target 19*), such as through the Global Invasive Alien Species Information Partnership[75];
- Increasing efforts to identify and control the main pathways responsible for species invasions, including through the development of border control or quarantine measures to reduce the likelihood of potentially invasive alien species being introduced and making full use of risk analysis and international standards (see Box 9.2);
- Putting in place measures for the early detection and rapid response to species invasions; and

- Identifying and prioritizing those invasive alien species with the greatest negative impact on biodiversity, and developing and implementing plans for their eradication or control, prioritizing protected areas and other areas of high biodiversity value;

START Box 9.1 - Turning the tide against centuries of species invasions: the case of New Zealand

New Zealand is among the countries most invaded by alien species. European colonists intending to recreate a familiar landscape and lifestyle established a legacy of species introductions going back centuries. Today, New Zealand has leveraged its isolation, as an island nation very distant from major trading partners, to turn the tide on unwanted species invasions. The country's strong policy of border protection originated from the desire to protect its agriculture from pests and diseases. New Zealand is also rich in endemic biodiversity. As the negative impacts of invasive species were recognized, the agricultural border protection measures translated readily to conservation border protection.

Even with these border controls, many alien species have been and continue to be introduced to New Zealand, and some become invasive. New Zealand has developed tools to respond to invasions once alien species enter the country. New Zealand's small size and governance structures have helped in successful implementation of these tools to prevent invasive species from spreading. Two strong legal frameworks have been implemented in New Zealand: the Hazardous Substances and New Organisms Act and the Biosecurity Act.

For protection of biodiversity from invasive species impacts, New Zealand has focused on using islands as 'arks' where threatened species can be reintroduced. The country has also pioneered methods to eradicate species introduced to islands, particularly mammals, to increase the amount of pest-free land area. New Zealand has eradicated introduced mammals from over 100 islands.

Following its success on smaller islands, New Zealand has developed 'mainland islands', which allow the technologies developed for invasive species eradications on islands to be applied in a larger landscape context. Some use mammal-proof fences to create enclosures within larger landscapes, and others use sustained pest control methods to maintain pest density at close to zero for agricultural or biodiversity benefits. There are currently over 25 fenced, and 100 unfenced 'mainland islands', across New Zealand. By increasing pest control connectivity among these sites it is predicted that pest control may scale to the entire country with appropriate governance guidance.

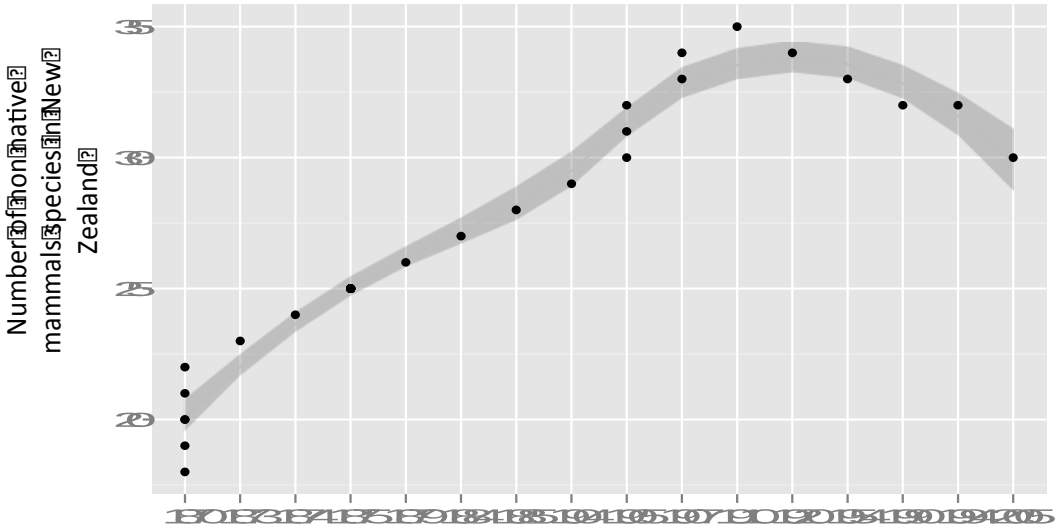


Figure 9.2. Number of non-native mammal species in New Zealand between 1876 and 2005 (points), the shade represents the 95% confidence interval. *Source: M.Clout, P. Genovesi from Simberloff et al. (2012), updated by J. Russel*

End of Box 9.1

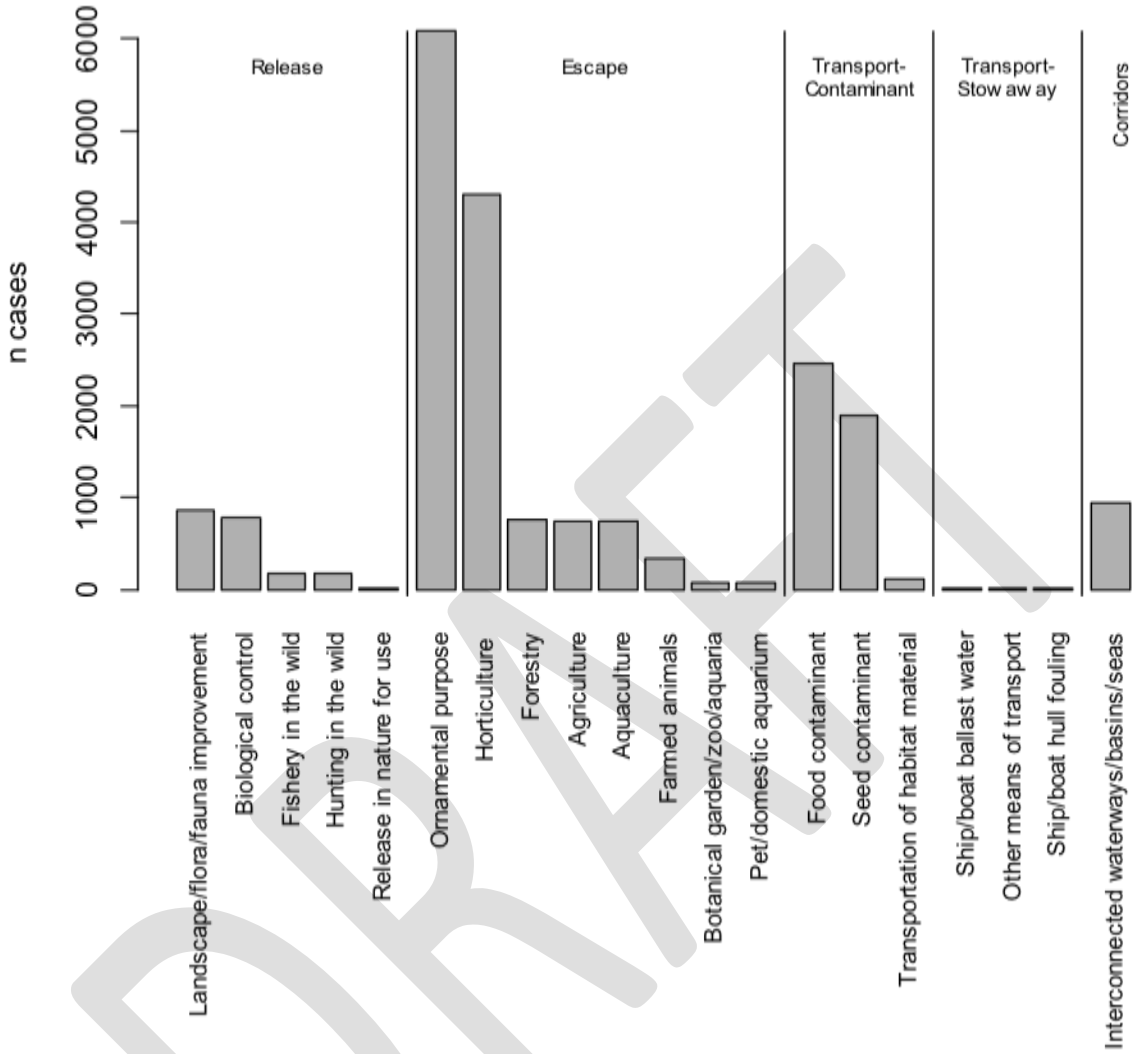


Figure 9.3 Frequencies of introduction pathways of alien species profiled in the Delivering Alien Invasive Species Inventories for Europe (DAISIE)

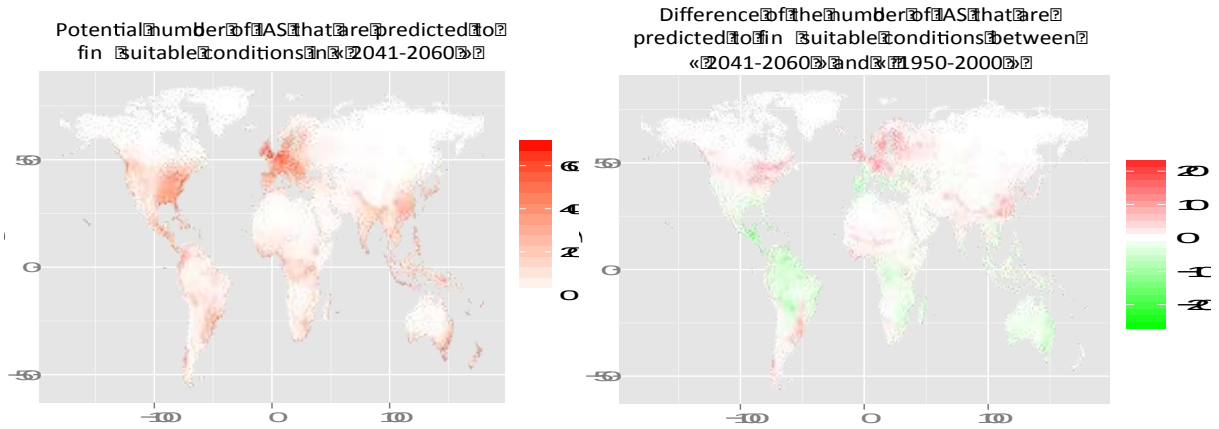


Figure 9.4. Projected changes in the occurrence of invasive alien species due to climate change. (Bellard et al., 2013).

Target 10: Vulnerable ecosystems

By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

Why this target is important:

Climate change and the associated acidification of the oceans are becoming increasingly serious threats to ecosystems and the services they provide to people. Some habitats including coral reefs, mountains and rivers are especially vulnerable to one or both of these pressures. While mitigating climate change is clearly the key long-term priority, urgent measures to relieve other pressures can make these ecosystems more resilient, protecting their biodiversity and the livelihoods of millions of people who depend on them. The urgency of this action was reflected in the decision to make 2015 the deadline for meeting this target, instead of 2020 as with most of the other targets.

Summary of progress towards the target:

Target elements (by 2015)	Status	Confidence
Multiple anthropogenic pressures on coral reefs are minimized, so as to maintain their integrity and functioning.	Moving away from target – 2015 deadline will NOT be met.	High
Multiple anthropogenic pressures on other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.	Not evaluated - Insufficient information available to evaluate the target for other vulnerable ecosystems including seagrass habitats, mangroves and mountains	--

Storyline (recent trends, current status and future projections):

Multiple pressures on coral reefs, both land-based and resulting from marine activities, continue to increase. This makes it unrealistic to believe that the target will be met by 2015 as agreed by governments. The percentage of reefs rated as threatened increased by nearly one-third (30 per cent) in the decade to 2007, the latest period assessed. Overfishing and destructive fishing methods are the most pervasive threats, affecting around 55 per cent of reefs. Coastal development and pollution from land, including nutrients from farming and sewage, each affect about one-quarter of reefs. Around one-tenth

suffer from marine-based pollution (see Figure 10.1). Local pressures are most severe in southeast Asia, where nearly 95 per cent of coral reefs are threatened.[76]

Large marine protected areas (MPAs) already in place or pending establishment offer opportunities for better protection of coral reefs in parts of the Indian Ocean, Pacific and Caribbean (Figure 10.2). Where well-enforced and combined with land-based protection measures, MPAs have succeeded in rebuilding reef fish stocks and even helping corals to recover after bleaching.[77] However, to date some MPAs have proven ineffective in easing pressure on reefs, with only some 15 per cent reducing the threats from fishing.[78]

A recent study of the Caribbean suggests that effective action to reduce greenhouse gas emissions, combined with management of local threats such as overfishing and poor water quality, would create favourable conditions for coral reefs to regenerate by the end of this century, and survive the impacts of ocean acidification (see Figure 10.2).[79]

While assessment for GBO4 has focused on coral reefs, other ecosystems especially vulnerable to climate change include mountain ecosystems such as cloud forest and *páramos* (high altitude tundra in tropical Americas) as well as low-lying ecosystems vulnerable to sea-level rise.

Few national biodiversity strategies and action plans (NBSAPs) or national reports to the CBD include specific measures to reduce multiple pressures on coral reefs and other ecosystems vulnerable to climate change. Exceptions include Finland and Brazil, which have both established targets to reduce human-induced pressures on vulnerable ecosystems.[80]

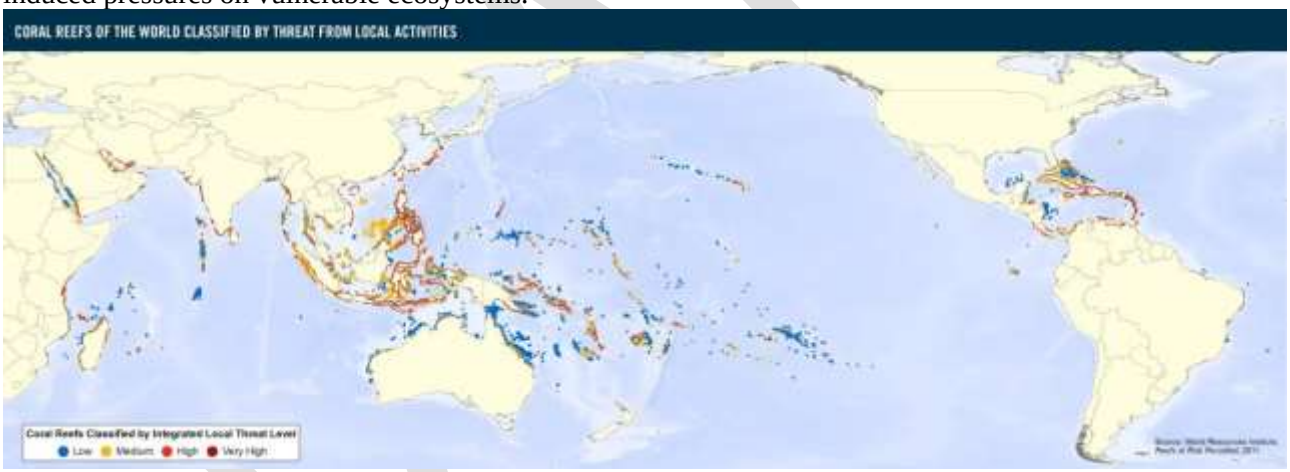


Figure 10.1. Distribution of coral reefs classified by human threat level, and the key threats faced by reefs in each region. *Source: Reefs at Risk Revisited, World Resources Institute, 2011.*

Region	**Source of threat**	**Percentage of reefs**	**By threat category**
		Threatened*	High / Very high
Southeast Asia	Main threat is from overfishing and destructive fishing	95%	50%
Atlantic Ocean	Multiple threats, Bahamas have largest reef area at low threat	75%	30%
Indian Ocean	Fishing most widespread threat	65%	35%
Middle East	Multiple threats. Exceptions include Chagos Archipelago, Maldives, Seychelles	65%	20%

Wider Pacific	French Polynesia, the Federated States of Micronesia, Hawaii and the Marshall Islands have some of the lowest sources of local stress.	50%	20%
Australia	Least threatened globally**	14%	1%

* Includes 4 local threats (coastal development, watershed-based pollution, marine-based pollution and damage – such as oil exploration and shipping – and fishing impacts) and 1 global threat (historical coral bleaching events in last 10 years).

** Although Australian reefs were considered to be the least threatened globally in 2011, new analyses of long-term monitoring and survey data have revealed that coral cover has decreased dramatically from a mean of 28% to 14% between 1985 and 2012 (De'ath et al. 2012). The causes of such decline were attributed to cyclones (48%), coral predation by crown-of-thorns starfish (42%), and coral bleaching (10%). Of these, only coral predation is likely to be caused by local human impacts (principally high nutrient runoff).

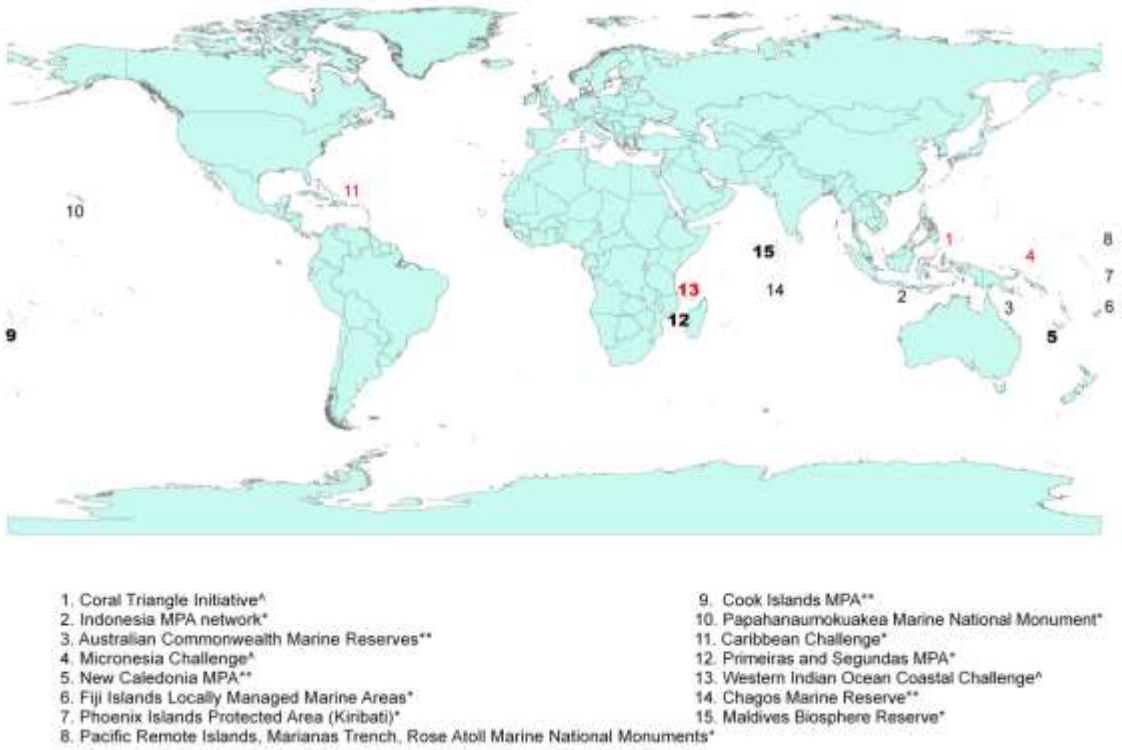


Figure 10.2. Recently established or proposed marine protected areas. Red numbers indicate initiatives involving more than one government, bold numbers are reserves pending establishment, *reserves less than 500,000 km^2; **reserves over 500,000 km^2; ^regional initiatives with MPAs unspecified. Map produced by Louise Teh for GBO4

Actions to Enhance Progress Towards the Target:

As noted, the 2015 deadline for meeting this target will not be met. It is therefore especially urgent that countries and relevant institutions take action to achieve the target at the earliest opportunity and before 2020. The following actions would help to accelerate progress towards Target 10. They would also contribute to other targets, shown in parentheses.

- Sustainably managing fisheries on coral reefs and closely associated ecosystems (such as mangroves and seagrass systems), including by empowering local and indigenous communities and individuals involved in local fisheries (Target 6).

- Managing coastal zones and inland watersheds in an integrated manner in order to reduce pollution and other land-based activities that threaten coral reefs (Target 8).
- Increasing the spatial coverage and effectiveness of marine and coastal protected and managed areas in coral reefs and closely associated ecosystems (Target 11).
- Managing coastal development to ensure that the health and resilience of coral reef ecosystems are not adversely impacted and promoting sustainable coral reef tourism, including through the use of guidelines for tourists and tour operators.
- Enhancing the resilience of coral reefs and closely associated ecosystems through ecosystem-based adaptation to enable the continued provisioning of goods and services (Target 14).
- Maintaining sustainable livelihoods and food security in reef-dependent coastal communities and provide for viable alternative livelihoods, where appropriate (Target 14).
- At a national level, identifying other ecosystems that are vulnerable to climate change and related impacts and implementing measures to improve their resilience.

START Box 10.1: Reducing local threats through private coral reef management

Local human-created threats pose the greatest risk to coral reefs in Southeast Asia. However, reef management in the region is often limited by lack of funds and resources. One approach for overcoming this challenge is the use of private sector resources for coral reef conservation. The establishment of the Sugud Islands Marine Conservation Area (SIMCA) in Sabah, Malaysia was initiated by owners of the sole dive resort situated within SIMCA, for the purpose of protecting the area's coral reefs and marine environment. Reef Guardian, a conservation organization, manages conservation activities to reduce local threats to the coral reefs within SIMCA. These include enforcement patrols to regulate illegal fishing, turtle monitoring and conservation, coral reef and environmental monitoring, sewage and wastewater treatment, removal of coral predators (crown of thorns), and conducting education programmes for schoolchildren to raise awareness about marine conservation. Reef Guardian's conservation work is funded by conservation fees charged to visitors to the dive resort, as well as donations and grants. Coral cover and fish abundance are greater within SIMCA compared to fished areas, and the number of turtle nestings shows an increasing trend through time.

Source: Teh et al. (2008)[81]

END of Box 10.1

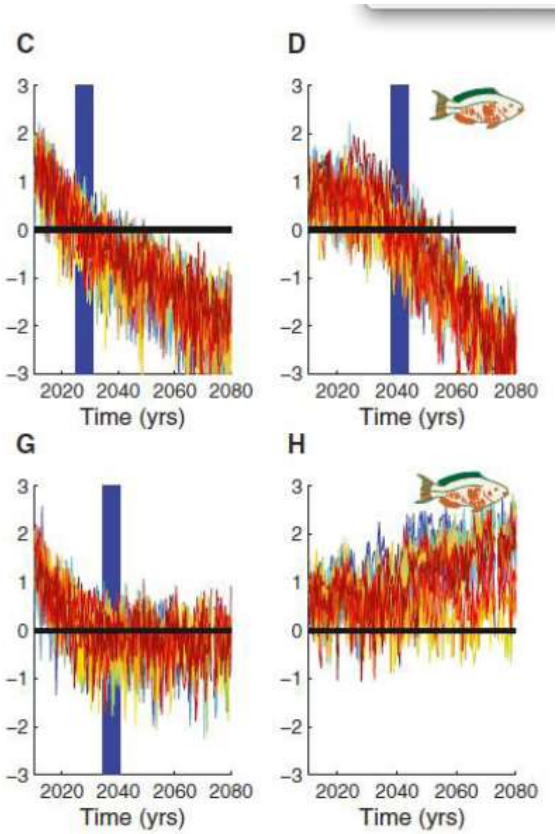


Figure 10.3. How early action can buy time for coral reefs. In scenarios of high greenhouse gas emissions, failure to control overfishing (**C**) leaves Caribbean corals unable to maintain their skeletons by the 2020s due to ocean acidification, while protection of grazing fish such as parrotfish **(D**) delays that situation by around a decade. With compelling action to curb greenhouse gas emissions, corals are still left in a vulnerable condition by the 2030s if overfishing is not addressed (**G**), whereas combined action on emissions and overfishing (**H**) offers Caribbean reefs good conditions to regenerate for the rest of this century. Source: Kennedy et al.(2013)

Strategic Goal C

To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity

Accompanying longer-term actions to address underlying causes of biodiversity loss and the pressures described in the previous sections, direct interventions to safeguard ecosystems, species and genetic diversity are an essential part of the policy mix. There are contrasting trends in progress towards the targets within this strategic goal. The area of land and coastal waters protected for biodiversity is likely to reach the thresholds set by governments in 2010, if current commitments for new protected areas are realized by the target date of 2020. However, significant additional measures are needed if these areas are to be representative of ecological regions, well connected, well managed and carry the support of local populations. Although actions to support particular threatened species have proven effective in preventing extinctions, these have not been enough to reverse the overall trend towards extinction for many species groups. Success in this regard will be highly dependent on further progress to address underlying causes and direct pressures. Actions to conserve the genetic diversity of plants through *ex situ* collections have advanced some aspects of this goal, but threats remain significant for the genetic diversity of domesticated plants and animals, and their wild relatives.

Target 11: Protected areas

By 2020, at least 17 per cent of terrestrial and inland-water areas and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascape.

Why this target is important:

As human activities come to dominate ever-increasing areas of the planet's land and water surface, governments have recognized the need to enlarge the network of protected areas, as a means to reconcile development with conservation of biodiversity. The figures included in this target represent a modest increase in the proportion of land protected, and a more ambitious increase for marine protected areas which begin from a much lower level. The target also recognizes that biodiversity will not be safeguarded simply by establishing more protected areas: they need to represent the diversity of the planet's ecological regions and include the most critical sites for threatened species, they need to be connected, to be effectively managed and to command the support of local populations.

Summary of progress towards the target:

Target elements (by 2020)	Status	Confidence
At least 17 per cent of terrestrial and inland water areas are protected.	On track to achieve target.	High
At least 10 per cent of coastal and marine areas are protected	Progress towards target but at an insufficient rate (when high seas included).	High
Areas of particular importance for biodiversity and ecosystem services protected	Progress towards target but at an insufficient rate	High (for biodiversity)
Protected areas are ecologically representative	Progress towards target but at an insufficient rate	High for terrestrial and marine, low for inland waters.
Protected areas are effectively and equitably managed	Progress towards target but at an insufficient rate.	Low
Protected areas are well connected and integrated into the wider landscape and seascape	Progress towards target but at an insufficient rate	Low or very low.

Storyline (current status and trends):

The terrestrial area of the planet protected for biodiversity is increasing steadily, and designation of marine protected areas is accelerating (Figure 11.1, A & B). Nearly a quarter of countries have already passed the target of protecting 17 per cent of their land area.

At the current rate of growth, the percentage targets would not be met either for terrestrial or for marine areas by 2020; however, given existing commitments to designate additional terrestrial protected areas,

this part of the target is likely to be achieved. The target for coastal marine protected areas is also on course to be met, although the high seas are much less well covered.

The protected area network is becoming more representative of the world's diverse ecological regions, but around one-quarter of terrestrial regions and more than half of marine regions have less than five per cent of their area protected (Figure 11.1, C-E).

Although 17 per cent of the world's river length fell within protected areas in 2010, the effectiveness of that protection is less certain due to upstream and downstream impacts (see Box 11.1).

A minority of protected areas enjoy sound management, although this appears to be improving over time given the limited information available.

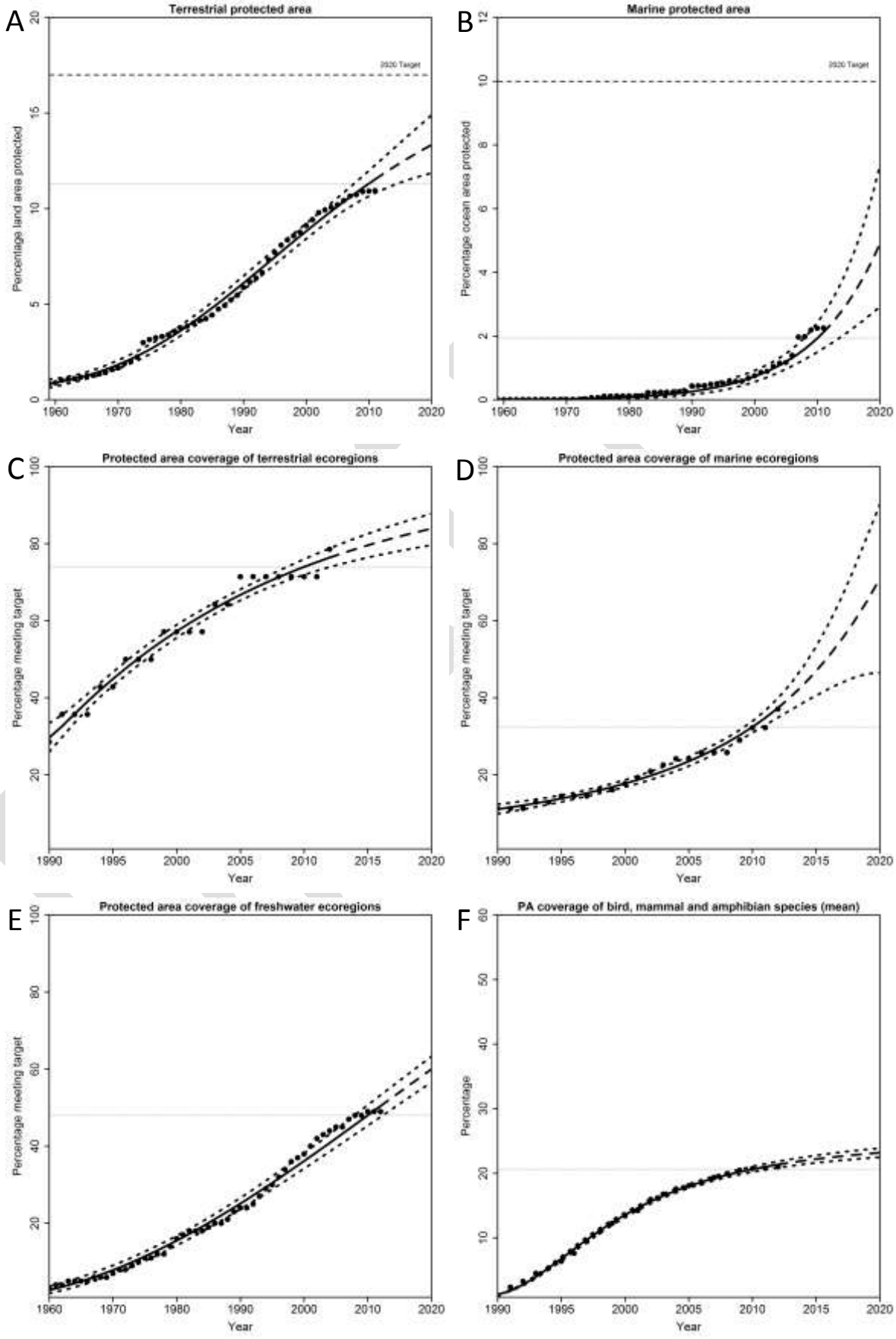
Today's protected areas will not be adequate to conserve many species whose distributions will shift in future due to climate change.

National actions reported to the CBD indicate that most countries have targets relating to improvement of protected area coverage, although a minority have quantitative targets and relatively few address issues of ecological representativeness, connectedness or management effectiveness.[82]

Actions to Enhance Progress Towards the Target:

The following actions would help to accelerate progress towards Target 11. They would also contribute to other targets, shown in parentheses.

- Expanding protected area networks to become more representative of the planet's ecological regions, of marine and coastal areas (including deep sea and ocean habitats), of inland waters and of areas of particular importance for biodiversity.
- Improving and regularly assessing management effectiveness of protected areas and other area-based conservation measures.
- Implementing adequate protection for inland water environments through additional measures to protect rivers upstream and downstream from existing terrestrial protected areas, and to maintain connectivity to enable migration within river basins (see Box 11.1).
- Enhancing cooperation with indigenous and local communities in the design and management of protected areas (Target 18). See Box 11.2.
- Designing and managing protected areas and the connections between with a view to the impacts of climate change on shifting species distributions.


A
Terrestrial protected area
2020 Target
Percentage land area protected
Year
B
Marine protected area
2020 Target
Percentage ocean area protected
Year
C
Protected area coverage of terrestrial ecoregions
Percentage meeting target
Year
D
Protected area coverage of marine ecoregions
Percentage meeting target
Year
E
Protected area coverage of freshwater ecoregions
Percentage meeting target
Year
F
PA coverage of bird, mammal and amphibian species (mean)
Percentage
Year

1

Figure 11.1. Recent trends and extrapolations to 2020, assuming constant underlying processes, in the cumulative percentage of global terrestrial (**A**) and marine (**B**) area covered by protected areas, suggesting a continued and significant increase in the underlying trend for both, with marine protected areas increasing at an accelerating rate; in the percentage of terrestrial (**C**), freshwater (**D**) and marine (**E**) ecoregions that meet a threshold level of protection (17% for terrestrial; 10% for marine and freshwater), all showing a significant increase; and in the coverage of the distributions of bird, mammal and amphibian species by protected areas **(F**), also increasing but at a decelerating rate. Long dashes represent the model projection for the extrapolation period. Short dashes represent 95% statistical confidence bounds for the modelled trend and extrapolations. Black dots represent data points. The horizontal dashed grey line is the model-estimated 2010 value for the indicator

START Box 11.1. Protecting inland water ecosystems: special challenges.

Inland waters are likely to be the least effectively managed environments because there are few targeted protected areas for inland waters, and in many cases where protection does exist (for example on Ramsar sites) upstream areas are not protected or managed in a way that will effectively abate threats. Furthermore, the pervasiveness of barriers such as dams can prevent fish movement into and out of protected areas. Regional-scale assessments of the coverage and effectiveness of protected areas have shown that freshwater habitats are not only under-protected, but that the placement of protected areas is ineffective for conserving these habitats and their species. For inland waters, climate change could exacerbate the negative effects of drying conditions that are currently natural in many temporal river systems It will be essential to protect refugia to maintain individuals that can repopulate a wider range of habitats when more favourable conditions are restored after seasonal or prolonged droughts. Minimizing and managing upstream and downstream threats from changes in human land use, expansions of dams and water extraction will also be critical for protected areas to be effective for inland waters and the species that they support.

For sources, see endnotes.[83]

END Box 11.1

START Box 11.2. Co-management of a national park in Thailand

In Ob Luang National Park, Northern Thailand, indigenous communities and park authorities are engaged in a process to achieve a more equitable and effective management of the protected area (a component of Target 11). The park, established in 1991, overlapped with the ancestral lands of Karen and Hmong indigenous communities. While Thailand's 2007 constitution allows indigenous peoples and local communities to manage their natural resources, they are still not legally allowed to live in protected areas. Being restricted in using their customary farming areas in the park caused severe conflict between officials and community members during the late 1990s.

To address the tensions and concerns, a pilot project for joint management in Ob Luang National Park was set up in 2005, and since 2009 a voluntary open-ended co-management process has been in place. This involves mapping and land demarcation of farmland surveys of conflict areas, discussions about problems encountered by the villagers, and collaborative monitoring of actual land use practices by indigenous peoples. Indigenous peoples are also admitted to meetings of park's management committees and informed and consulted on the work plans.

The joint management approach has clearly had visible positive effects, such as reduced tensions between the government and communities, increased protection of forests and watersheds, and improved livelihood security for indigenous peoples and local communities. Based on the positive experiences in Ob Luang, there is interest among the National Park authorities and communities to explore the expansion of the joint management approach to other protected areas in Thailand. Major progress has been achieved in moving from conflict to collaboration, benefiting both biodiversity and people. An important further step be to revise relevant national laws to support innovative collaborative management of protected areas for effective implementation of Target 11.

Source: Forest People's Programme

END Box 11.2

Target 12: Reducing risk of extinction

By 2020, the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

Why this target is important:

Reducing the threat of human-induced extinction requires action to address the direct and indirect drivers of change, and achievement of this target is therefore highly dependent on most of the other Aichi Biodiversity Targets. Nevertheless, imminent extinctions of known threatened species can in many cases be prevented by protecting the sites where such threatened species are located, by combating particular threats, and through *ex situ* conservation.

Summary of progress towards the target:

Component (by 2020)	Status	Confidence
Extinction of known threatened species has been prevented	No significant change.	Low
The conservation status of those species most in decline has been improved and sustained.	Moving away from the target	High

Storyline (recent trends, current status and future projections):

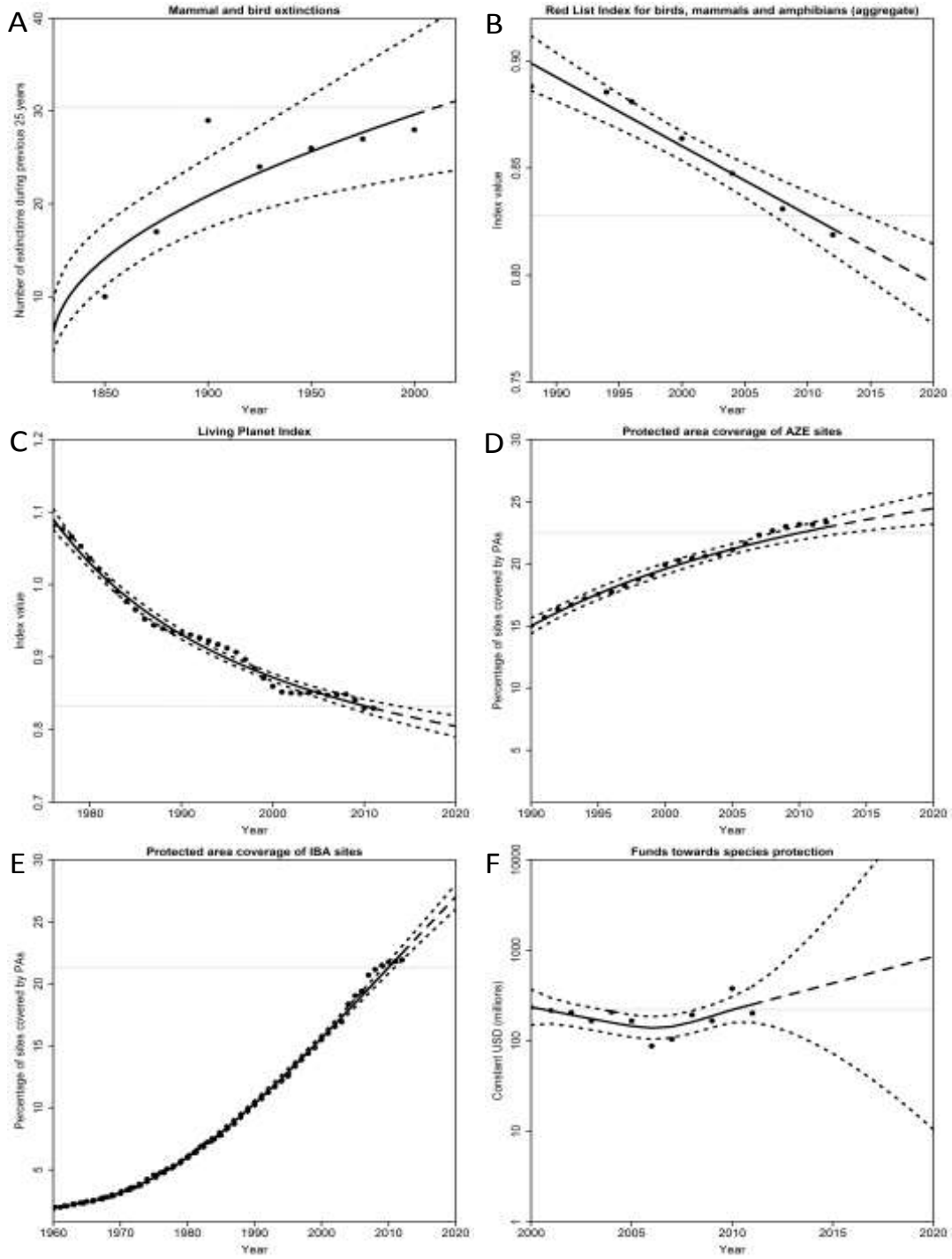
Multiple lines of evidence give **high confidence that based on our current trajectory, this target would not be met by 2020**, as the trend towards greater extinction risk for several taxonomic groups has not decelerated since 2010. Despite individual success stories, the average risk of extinction for birds, mammals and amphibians shows no sign of decreasing (Figure 12.1). Nevertheless, dedicated conservation efforts have demonstrably prevented the extinction of several species in these groups, and further action might prevent some extinctions that would otherwise occur by 2020.

The rate of increase in observed extinctions of birds and mammals has apparently slowed over the past 50 years, although lags in reporting time may lead to an underestimate of recent extinctions. For some groups such as freshwater fish, the number of observed extinctions has continued unabated for the past century.

Short-term future projections of the extinction risk of species as a result of projected habitat loss generally predict a worsening situation. However, under some scenarios in which natural habitats are protected and restored, and greenhouse gas emission are reduced extinctions both globally and locally may be significantly reduced in the longer term.

One positive trend related to this target is that an increasing proportion of sites critical to the survival of threatened species are being included within protected areas (See Figure 12.1, D&E).

About one third of national reports assessed for GBO4 suggest that the conservation status of at least some species is improving, and reported actions include reducing the threat from poaching (South Africa), breeding programmes for particular species (Japan) and providing protected status for some species (Mongolia, Nepal).



1. Figure 12.1. Recent trends in six key measures of the extinction, extinction risk and conservation status of species, with extrapolations to 2020 assuming constant underlying processes: (A) observed extinction rates of birds and mammals, showing a rising trend[84]; (B) the aggregate Red List Index of birds, mammals and amphibians – significant decrease suggesting a continuing movement towards extinction; (C) the Living Planet Index, with a significant decrease reflecting declines in species populations; (D) representation by protected areas of sites whose protection could avert the extinction of known threatened species: Alliance for Zero Extinction sites (AZEs) and (E) Important Bird Areas, with significant increases suggesting progress towards averting future extinctions;[85] and (F) funds for the protection of species showing no significant change in the underlying trend between 2010 and 2020.Solid black line represents the model fit for the period with data. Long dashes represent the model projection for the extrapolation period. Short dashes

represent 95% statistical confidence bounds for the modelled trend and extrapolations. Black dots represent data points. The horizontal dashed grey line is the model-estimated 2010 value for the indicator.

Actions to Enhance Progress Towards the Target:

The following actions would help to accelerate progress towards Target 12. They would also contribute to other targets, shown in parentheses.

- Species action plans aimed directly at particular threatened species, for example through restrictions on hunting and trade, captive breeding and reintroductions, have proven effective in the past and will remain important for achieving this target.
- However, reducing the risk of species extinctions depends crucially on achievement of several other targets, in particular:
  - Significantly stepping up conservation efforts through more representative and better-managed protected areas, including sites of special importance to biodiversity, freshwater habitats and marine protected areas (Target 11);
  - Reducing loss, degradation and fragmentation of habitats (Target 5), and actively restoring degraded habitats (Target 15);
  - Promoting fishing practices that take account of the impact of fisheries on marine ecosystems and non-targeted species (Target 6);
  - Controlling invasive alien species and pathogens (Target 9), especially crucial to avoid extinctions of species on islands and those with small global ranges;
  - Identifying and prioritizing species for conservation activities based on assessments of species conservation status (Target 19);
  - Filling gaps in existing national, regional and global species conservation status assessments (Target 19);
  - Reducing pressures on habitats through sustainable land-use practices (*Target 7*); and
  - Reducing pressures from trade, by increasing awareness among potential consumers of products from threatened species (*Target 1*), and through actions agreed under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (*Target 4*).

START Box 12.2: Preventing extinction of vultures in South Asia.

Once present in numbers ranging over tens of millions across India, Pakistan, Bhutan, Nepal and Bangladesh; vultures today are on the brink of extinction. Since the 1990s, virtually unnoticed, the vulture population has witnessed the most dramatic decline of a wild species in human history. Across the Indian subcontinent, the populations of three formerly common species of vultures – Oriental White-backed Vulture (*Gyps bengalensis*), Long-billed Vulture (*Gyps indicus*) and Slender-billed Vulture (*Gyps tenuirostris*) – have declined precipitously. Extensive studies have identified the cause of declines to be *Diclofenac*, an anti-inflammatory drug commonly used for treating domestic livestock that is highly toxic to vultures, causing death due to kidney failure. In response to the crisis, the Indian government has approved an alternative vulture-safe drug, *Meloxicam*, and established a directive to phase out *Diclofenac* within a stipulated time frame – starting with a ban on its veterinary use in 2006. Despite this, there is mounting evidence that *Diclofenac* continues to be available and used for veterinary purposes; resulting in a continuation of vulture deaths and losses in valuable ecosystems services in the region.

Sources: GIST, Oaks et al., 2004, Green et al., 2004, Shultz et al., 2004

END of Box 12.2

Target 13: Safeguarding genetic diversity

By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species is maintained and

strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

Why this target is important:

Genetic diversity offers options for increasing the resilience of agricultural systems and for adapting to changing conditions, including the escalating impacts of climate change. Maintaining this diversity requires conservation of the many varieties of cultivated plants and breeds of domesticated livestock bred by farmers over thousands of years; and of the wild relatives of crops whose traits may be essential for future plant breeding and thereby underpin food security.

Summary of progress towards the target:

Target elements (by 2020)	Status	Confidence
The genetic diversity of cultivated plants is maintained	Progress towards target but at an insufficient rate	High
The genetic diversity of farmed and domesticated animals is maintained	Progress towards target but at an insufficient rate	High
The genetic diversity of wild relatives is maintained	No significant change	Medium
The genetic diversity of socio-economically as well as culturally valuable species is maintained	Insufficient data to evaluate this component	
Strategies have been developed and implemented for minimizing genetic erosion and safeguarding genetic diversity	Progress towards target but at an insufficient rate	High

Storyline (recent trends, current status and future predictions):

Ex situ collections of genetic resources continue to improve, particularly for plants, and there are increasing activities to conserve genetic resources in their production environment. Major recent initiatives on *ex situ* conservation include the Svalbard Global Seed Vault, which in 2014 stored more than 800,000 seeds of over 4,500 species; and the Millennium Seed Bank Partnership which currently stores nearly two billion seeds of over 33,000 species.

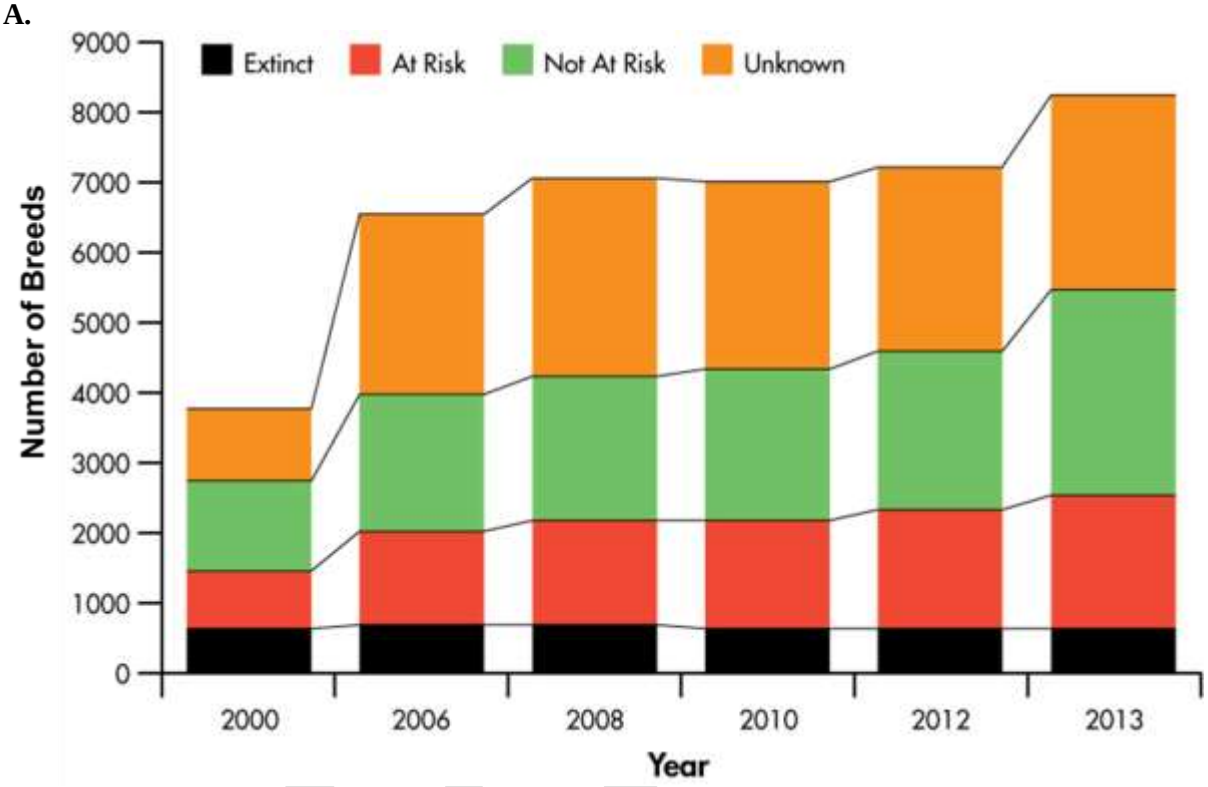
However, there is currently limited support to ensure long term conservation of local varieties of crops in the face of changes in agricultural practices and market preferences that are tending, in general, to promote a narrowing genetic pool. The wild relatives of domesticated crop species are increasingly threatened by habitat fragmentation and climate change, and few protected areas or management plans address these threats. Erosion of traditional crops and their wild relatives is greatest in cereals, followed by vegetables, fruits and nuts and food legumes.

Genetic diversity of domesticated livestock is eroding, with more than one-sixth of the 8,2000 assessed breeds (16%) at risk of extinction[86]. Based on recent trends and assuming current pressures continue, this proportion is projected to increase further by 2020 (Figure 13.1).

With regards to the development of strategies for minimizing genetic erosion and safeguarding genetic diversity the FAO Global Plans of Action for plant and animal genetic resources provide frameworks for the development of national and international strategies and action plans. However existing conservation efforts have important gaps

National action as documented in recent reports to the CBD has focused primarily on conserving the genetic diversity of cultivated plants, with few reports providing information on measures to conserve the genetic diversity of livestock or crop wild relatives.

A.



B.

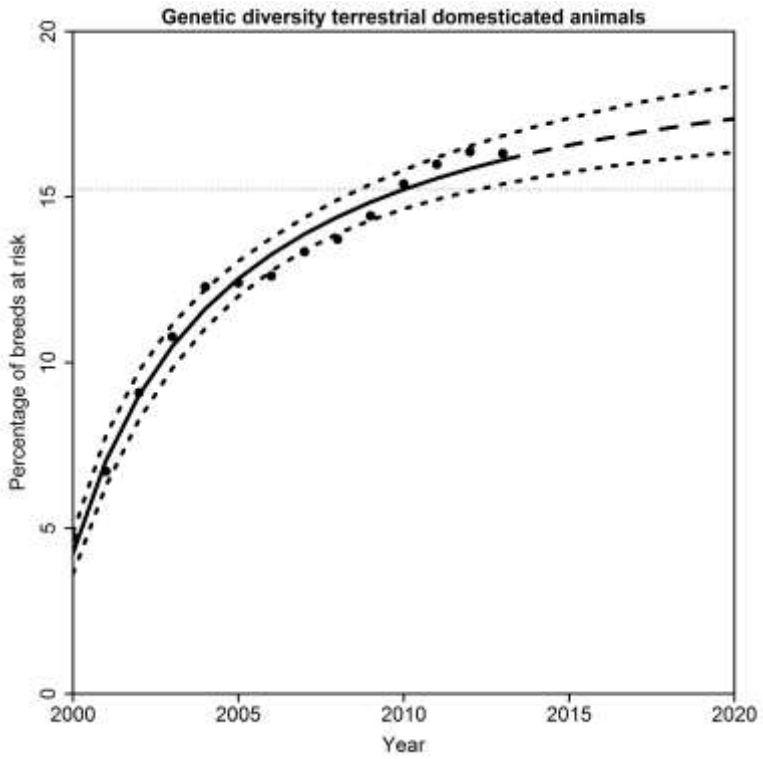


Figure 13.1. A. Proportion of the world's terrestrial animal breeds reported to the FAO by risk status (2013), and **B.** the percentage of breeds classified as at risk, including extrapolation to 2020 assuming constant underlying processes. Solid black line represents the model fit for the period with data. Long dashes represent the model projection for the extrapolation period. Short dashes represent 95% statistical confidence bounds for the modelled trend and extrapolations. Black dots represent data points *Source: FAO, 2013*

Actions to Enhance Progress Towards the Target:

The following actions would help to accelerate progress towards Target 13. They would also contribute to other targets, shown in parentheses.

- Promoting public policies and incentives to maintain local varieties of crops and indigenous breeds in production systems (*Targets 2, 3, 7*), including through increased cooperation with, and recognition of, the role of indigenous and local communities and farmers in maintaining genetic diversity *in situ* (see Box 13.2).
- Enhancing the use and maintenance of genetic diversity in plant and animal breeding programmes, and raising awareness of the importance of genetic diversity and its contribution to food security (*Targets 1 and 7*);
- Integrating the conservation of the wild relatives of domesticated crops and livestock in management plans for protected areas, conducting surveys of the location of wild relatives, and including this information in plans for the expansion or development of protected area networks (*Target 11*). See Figure 13.2;
- Maintaining support for national and international *ex situ* conservation, such as genebanks of plant and animal genetic resources including *in vitro* conservation.

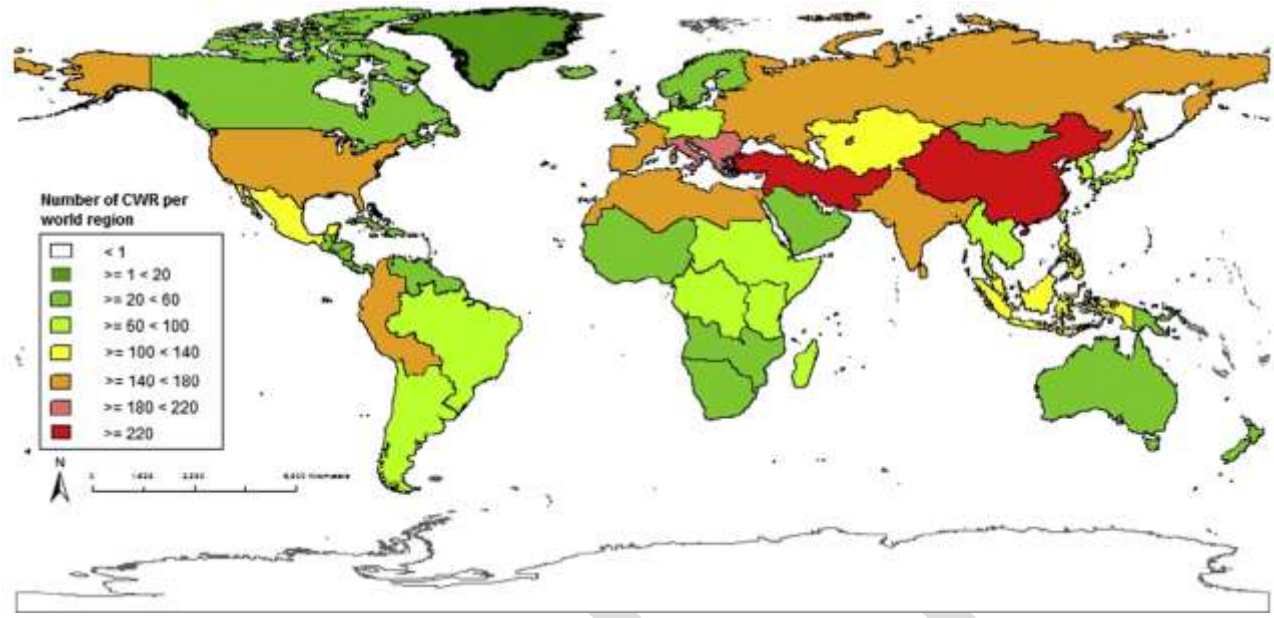


Figure 13.2. Number of priority crop wild relatives per world region, based on an inventory of wild plants important for maintaining genetic diversity of 173 crops (Vincent et al. 2013)

START Box 13.2. Maintaining traditional crop diversity on small family farms

In one study, data from 27 crop species from five continents were drawn together to determine overall trends in diversity of crop varieties on farms. Measurements of richness, evenness, and divergence showed that considerable crop genetic diversity continues to be maintained on farms, in the form of traditional crop varieties. The research suggested that in some cases, diversity may be maintained as a form of insurance to meet future environmental changes or social and economic needs. In other cases, farmers were apparently selecting varieties to service a diversity of current needs and purposes. It underscores the importance of a large number of small farms adopting diverse strategies regarding crop varieties, as a major force that maintains crop genetic diversity on farms.

Source; Jarvis et al. 2008.

END of Box 13.2.

Strategic Goal D

Enhance the benefits to all from biodiversity and ecosystem services

Biodiversity underpins the services provided by ecosystems vital to humankind, such as the provision of food, clean water, the removal of wastes and the mitigation of the impacts of extreme events. The Strategic Plan for Biodiversity recognized that special attention was needed to safeguard and restore those ecosystems of particular importance to human well-being due to the benefits they provide to people and economies. The continued decline of many ecosystems providing multiple services, especially to the poor and vulnerable, suggests the need for significant additional action to achieve this goal. On the other hand, significant steps have been made or planned to restore degraded ecosystems, and the Nagoya Protocol aimed at more equitable sharing of benefits arising from access to genetic resources is likely soon to be in force.

Target 14: Ecosystem services

By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities and the poor and vulnerable.

Why this target is important:

All terrestrial, freshwater and marine ecosystems provide multiple ecosystem services. However some ecosystems are particularly important in that they provide services that directly contribute to human health and wellbeing by providing services and goods to fulfill daily physical, material, and cultural needs. This target directs attention towards the need for policies to focus specifically on restoring and safeguarding such ecosystems, thus linking biodiversity conservation with goals related to sustainable development and the needs of the poor, women and indigenous and local communities.

Summary of progress towards the target:

Target elements (by 2020)	Status	Confidence
Ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded …	No significant change	Low
… taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.	Moving away from target	Low

Storyline (recent trends, current status and future projections):

Habitats important for ecosystem services, for example wetlands and forests, continue to be lost and degraded. Some groups of species of special importance to the poor, for example birds and mammals used in food and medicine, are moving more quickly towards extinction than species not used for these purposes (Figure 14.1).

Recent sub-global assessments have confirmed the global trend in the decline of services provided to people by ecosystems. For example, the United Kingdom National Ecosystem Assessment in 2011 concluded that some 30 per cent of ecosystem services were declining, largely as the result of declines in the extent and condition of habitats providing those services. However, such assessments have also identified scenarios in which ecosystem services would improve in the longer term (Figure 14.3).

The state of marine ecosystems as measured by the Ocean Health Index, falls far short of their potential to provide for human needs through a wide variety of services including food provision, recreation, coastal protection and carbon storage (Box 14.2). The decline of Arctic sea ice, linked to climate change, presents particular challenges to northern local and indigenous communities (Box 14.1).

A number of countries are taking action to safeguard ecosystems providing essential services such as water provision to urban populations (see Box 14.3). However, few have set national targets explicitly addressing this global target.

Overall, available evidence shows **little sign of progress towards meeting this target** by the deadline of 2020, and in the case of services of particular importance to local and indigenous communities, women, the poor and vulnerable, trends appear to be **moving in the wrong direction.**

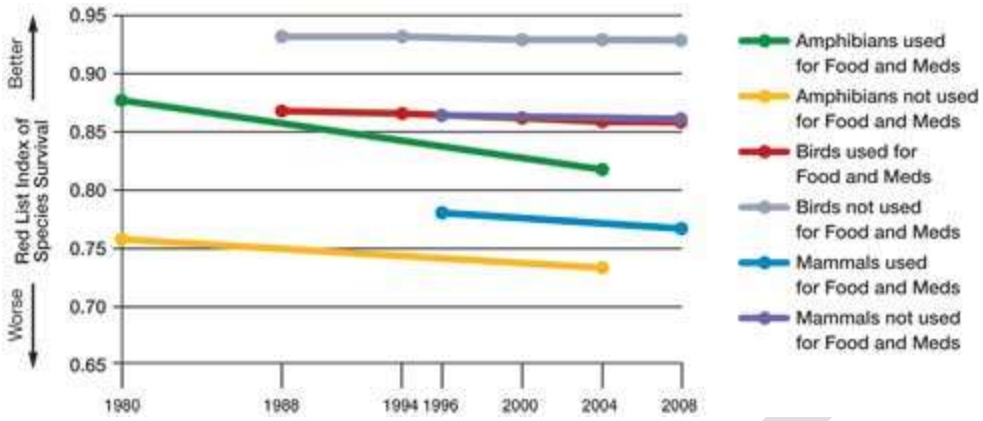


Figure 14.1. Red List Index for amphibians, bird, and mammals, shown separately for those species used for food and medicines, and those without such uses. The comparison suggests that species providing these services to people are, on average, more threatened with extinction than species as a whole (source: Chenery et al. 2013).

Actions to Enhance Progress Towards the Target:

The following actions would help to accelerate progress towards Target 14. They would also contribute to other targets, shown in parentheses.

- Identifying, at the national level, those ecosystems that are particularly important in providing ecosystem services, with particular attention to ecosystems upon which vulnerable groups are directly dependent for their health, nutrition and general well-being and livelihoods, as well as ecosystems that help to reduce risks from disasters, employing, as appropriate, integrated assessment and/or participatory appraisal methodologies;
- Improving monitoring of the status of such ecosystems and of the essential services that they provide to facilitate targeted actions;
- Removal of perverse subsidies and other forms of public support for infrastructure that destroys, fragments or degrades ecosystems (Targets 2, 3)
- Reducing the pressures on and, where necessary, enhancing the protection and restoration of those ecosystems providing essential services (for example wetlands, coral reefs, rivers and forests and mountain areas as "water towers" among others) (Targets 5, 6, 7, 8, 9, 10, 15);
- Investing in and making better use of traditional knowledge, about ecological systems, processes and uses held by indigenous and local communities, and promoting customary sustainable use (*Target 18*).

START Box 14.1: The decline of sea ice habitat and its impact on ecosystem services.
Disappearing sea ice is affecting the building blocks of life in the Arctic Ocean with changes resonating throughout entire food webs. These changes affect everything from ice-dependent algae to birds, fish, marine mammals and human communities that rely on sea ice for travel, food, economic opportunities and cultural activities.

Such changes in environments and wildlife have implications for northern people's food security and for wildlife and habitat management. Adaptation is already occurring, with some indigenous peoples adjusting to different hunting seasons. But the knowledge and reliability of these environments that indigenous and local peoples hold is being tested by the nature of the rapid changes underway.

Safeguarding sea ice habitat and associated biodiversity is connected to climate change. International cooperation is increasingly needed to fully address the conservation challenges that face Arctic biodiversity.

Source: the Arctic Biodiversity Assessment (2013)[87]

END of BOX 14.1

START Box 14.2. The Ocean Health Index.

The Ocean Health Index uses a portfolio of ten public goals for measuring the overall condition of marine ecosystems. The index score for the ocean within Exclusive Economic Zone (EEZ) boundaries is 60 out of 100, providing an important benchmark and indicating substantial room for improvement across the goals (Figure 14.2). Index scores vary greatly by country, ranging from 36 to 86, with many West African, Middle Eastern and Central American countries scoring poorly, and parts of Northern Europe, Canada, Australia, Japan and various tropical island countries and uninhabited regions scoring highly. Of all EEZs, 32 per cent had an index score of less than 50, whereas only five per cent had a score of greater than 70.

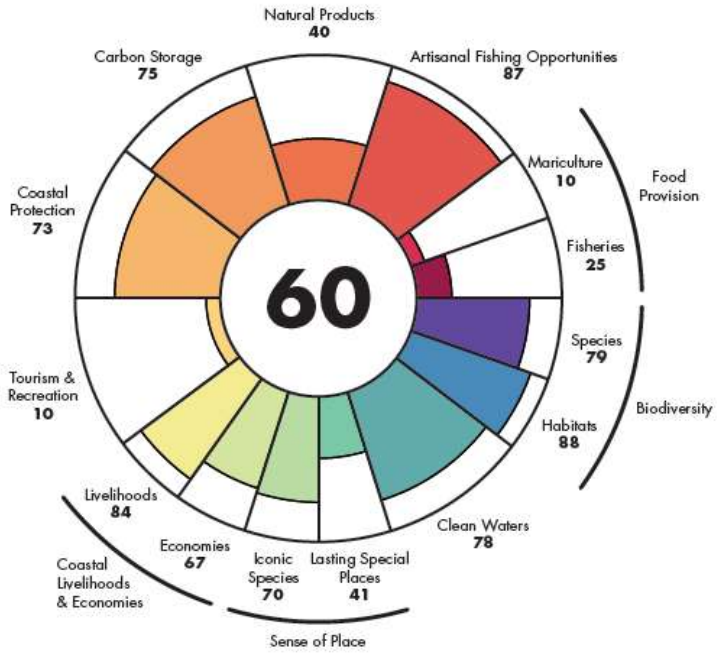


Figure 14.2. The Ocean Health Index score (inner circle) and individual goal scores (coloured petals) for global area-weighted average of all countries. The outer ring is the maximum possible score for each goal, and a goals score and weight (relative contribution) are represented by the petal's length and width, except for 'food provision' sub-goals which are weighted by relative actual yield despite equal width of petals. Source: Halpern et al. 2012.

END Box 14.2

START Box 14.3. Restoring rivers to protect urban water supplies in South Africa

South Africa's second largest city, Durban, faces major water security challenges. Durban's water comes mainly from the greater uMngeni catchment, in which industry and intensive agriculture combine with challenges such as failing waste water treatment works and water-thirsty invasive plants to compromise the quantity and quality of water delivered to Durban. The eThekwini Municipality's Water and Sanitation Department, together with the KZN Regional Office of the Department for Water Affairs (DWA), Umgeni Water, the uMgungundlovu District Municipality, the Msunduzi Local Municipality and the South African National Biodiversity Institute (SANBI), have spearheaded the establishment of a partnership to foster better collaboration and coordination of ecological infrastructure investments aimed at improving water security in the greater uMngeni catchment. The uMngeni Ecological Infrastructure Partnership, launched in 2013, comprises 36 government and civil society organisations, 17 of which

have signed a memorandum of understanding. On the same day of the MoU signing, three pilot projects on restoring ecological infrastructure were launched (Palmiet River Rehabilitation Project, Bayne's Spruit Rehabilitation Project, and Save the Midmar Dam Project). It is hoped that lessons from the uMngeni Ecological Infrastructure Partnership will inform investment in the maintenance and restoration of ecological infrastructure in other parts of South Africa, through partnerships at the landscape scale.
Source: 5th National Report to the CBD, South Africa[88]
***END Box* Box 14.3.**

Target 15: Ecosystem restoration and resilience

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

Why this target is important:

The reversal of habitat loss, fragmentation and degradation, through ecosystem restoration, represents an immense opportunity for both biodiversity restoration and carbon sequestration. Restored landscapes and seascapes can improve resilience, including the adaptive capacity of ecosystems and societies, contributing to climate change adaptation and generating ecosystem services and associated benefits for people, in particular indigenous and local communities and the rural poor. This target also links biodiversity conservation to sustainable development goals.

Summary of progress towards the target:

Target elements (by 2020)	Status	Confidence
Ecosystem resilience and the contribution of biodiversity to carbon stocks have been enhanced through conservation and restoration	No significant change	Low
At least 15 per cent of degraded ecosystems are restored, contributing to climate change mitigation and adaptation, and to combating desertification	On track to achieve target	Low

Storyline (recent trends, current status and future projections):

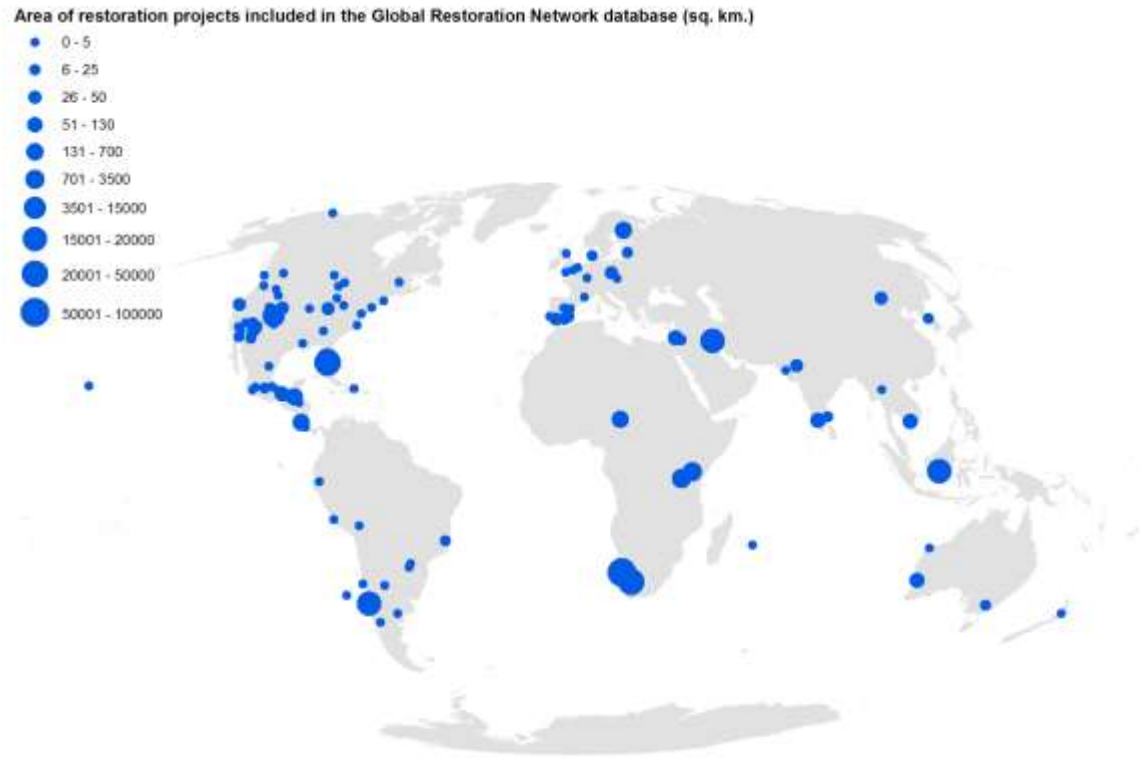
The science behind ecosystem restoration has advanced significantly in recent decades, providing a range of tools and techniques that greatly increase the likelihood of success, for example in the choice of seeds for planting, control of grazing, and management of water, fire and invasive species.

Restoration is under way for some depleted or degraded ecosystems, especially wetlands and forests, sometimes on a very ambitious scale, as in China (see Box 15.2). Many countries, organizations and companies have pledged to restore large areas (Figure 15.1). Abandonment of farmland in some regions including Europe, North America and East Asia is enabling 'passive restoration' on a significant scale (Box 15.1).

While few countries have reported quantitative targets for restoration, the European Union has set an ambitious target to maintain and enhance, by 2020, ecosystems and their services by establishing green infrastructure, and restoring at least 15 per cent of degraded ecosystems.

Despite restoration and conservation efforts, there is still a net loss of forests, a major global carbon stock, suggesting **no overall progress on this component of the target**. The combined initiatives currently under way or planned **may put us on track to restore 15% of degraded ecosystems by 2020**, but it is hard to assess and we cannot be confident that this part of the target will be met.

A.



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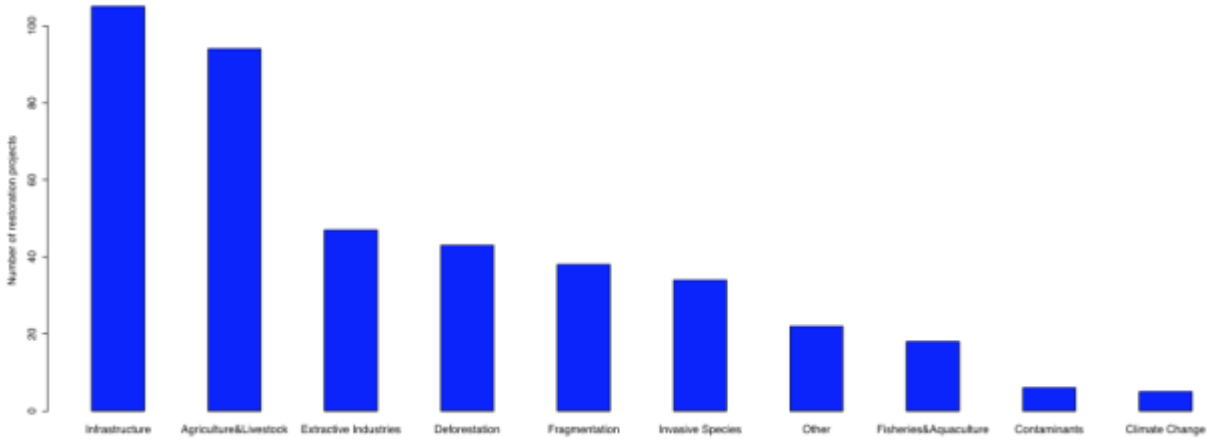


Figure 15.1. A. Active restoration projects in the Global Restoration Database (February 2014). The size of the dot represents the area of the restoration project. b) restoration projects by degradation types. Source: Global Restoration Network Database.

Actions to Enhance Progress Towards the Target:

The key steps are:

The following actions would help to accelerate progress towards Target 15. They would also contribute to other targets, shown in parentheses.

- Developing a comprehensive land-use mapping and planning approach which provides for the protection, and if necessary, the restoration of native vegetation on vulnerable sites (eg: waterways, coastal areas, sloping land, hilltops), enables increased ecological connectivity, and, as appropriate, specifies minimum areas for native vegetation;
- Identifying opportunities and priorities for restoration, including highly degraded ecosystems, areas of particular importance for ecosystem services and ecological connectivity, and areas undergoing abandonment of agricultural or other human-dominated use, taking into full account the current use of land, including by indigenous and local communities;
- Expanding, further developing and implementing strategies to restore at least 15 per cent or more of degraded areas, including through environmental permitting procedures and market instruments such as wetland mitigation banking, payments for ecosystem services and other mechanisms (Targets 2 and 3);
- Increasing the contribution of biodiversity to carbon sequestration through state or private sponsored passive and active afforestation programs, such as the REDD+ mechanism.
- Where feasible, making restoration an economically viable activity, by coupling income generation to restoration activities (for example by using fast-maturing shade trees that can provide an early financial return and encourage private sector investment).

START Box 15.1. Agricultural abandonment and rewilding in Europe.

The European landscape is marked by millennia of human pressure on the land. Over the last few decades, as market competition increased globally, agriculture became less profitable for European farmers in areas that are both less productive and harder to cultivate (Gellrich et al., 2007; MacDonald et al., 2000). This led to substantial rural depopulation since the mid 20th century, feeding a "circle of decline" of remote agricultural areas, only tempered by the subsidies system of the European Common Agricultural Policy (Stoate et al., 2009). Between 1990 and 2000, nearly half a million hectares were converted from agriculture to (semi)-natural areas (EEA, 2012). Future scenarios predict that the aging rural population in remote areas will not be replaced, hence increasing the contraction in Europe's

farmland area on semi-natural grasslands and mountain areas (Keenleyside and Tucker, 2010). Some scenarios project a further decrease of up to 15% in the total agricultural area of the EU27 by 2030 (Verburg and Overmars, 2009), consistent with projections of up to 20% loss in the area used by the main food crops in developed countries by 2050 (Balmford et al., 2005). The areas projected to be abandoned are mainly located in mountain ranges, but also more generally in central Europe, Northern Portugal and Southern Scandinavia (Navarro and Pereira, 2012) (Fig. 15.7).

Rewilding aims at restoring natural ecological succession, leading to self-sustaining ecosystems and ecosystem processes (Navarro and Pereira, 2012), and emphasizes process-based conservation approaches. Most of European arable land would need 12 to 20 years to go from abandoned to (semi) natural, but some areas would require more than 40 years (Verburg and Overmars, 2009), to which another 15 to sometimes over 50 more years must be added until forest becomes the dominant cover. Moreover, the withdrawal of agriculture might leave a land vulnerable to species invasions and fire (Stoate et al., 2009). These limits to passive restoration can be overcome by active measures in early post-abandonment stages, such as the localized establishment of seed banks (Rey Benayas et al., 2008) or even the reinforcement or reintroduction of disturbance agents, i.e. grazers, browsers and prescribed burning (Sandom et al., 2013b).

A recent review (Navarro and Pereira, 2012), identified 60 bird species, 24 mammal species and 26 invertebrate species that would benefit from land abandonment and rewilding while another 101 "looser" species were identified. Europe is currently witnessing a wildlife comeback (Deinet et al., 2013; Enserink and Vogel, 2006), especially of species of European megafauna, most of which were locally extinct in many regions, such as Iberian ibex, Eurasian elk, roe deer, red deer, wild boar, golden jackal, and grey wolf (Deinet et al., 2013; Navarro and Pereira, 2012). Nonetheless, land abandonment was also identified as a threat for some bird species such as the Barnacle goose, white stork, lesser kestrel, saker falcon, bearded vulture, and eastern imperial eagle (Deinet et al., 2013). Still, the impacts of rewilding on farmland-associated species will be likely attenuated by their adaptation to alternative habitats and by the maintenance of habitat mosaics at regional scales (Proença and Pereira, 2010).

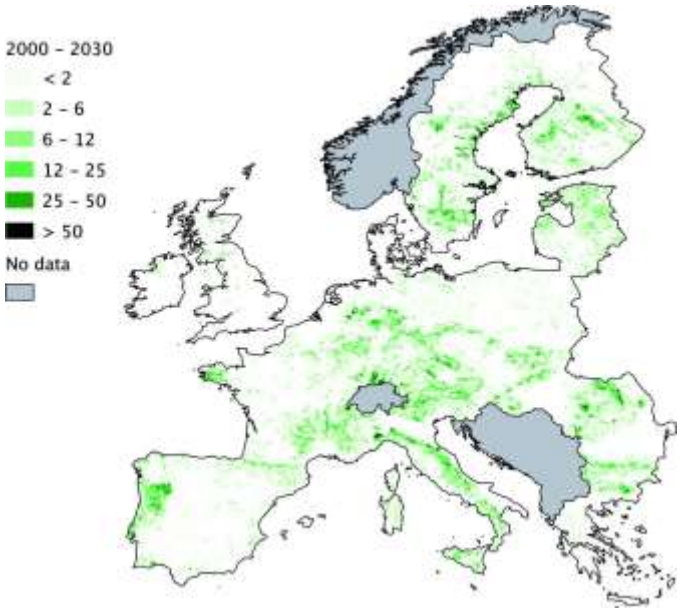


Figure 15.2: Areas projected for transition from agriculture to forest or semi-natural habitats 2000-2030. Figures are percentage of the area of each 100km^2 grid cell. Source: tbc from technical chapter fig 15.7.

END of Box 15.1

START Box 15.2. The 'Grain for Green' policy in western China.

Desertification, sandstorms and floods in China have been attributed to the extensive land degradation and desertification in the west of the country, which also encompasses the upper reaches of the two largest rivers of China, Yangtze and the Yellow river (Liu et al., 2008). The Grain-for-Green policy was initiated in in 1999 as a pilot project and it was extended in 2002 to 25 Chinese provinces (Liu et al., 2008; Xu et al., 2006b). The program was designed to afforest 15 million ha of low-yield farmland and 17 million more ha of barren lands (Feng et al., 2005). Moreover, regulations establish that cultivated land on areas with slopes of more than 25o have to be terraced or restored with vegetation that will protect against erosion (Feng et al., 2005). To compensate the loss of agricultural fields, the farmers receive subsidies and grains, and they keep all the profits arising from restored forests and pastures (Yan-qiong et al., 2003). The total planned investment of the Chinese Government in the Grain-for-Green program is approximately 70 billion USD (Liu et al., 2008).

Although rising prices of agricultural products at national level have been blamed on the grain-for-green program, a study has estimated the impact on agricultural yield at only 2-3% of the national production, although at the local level the impact can be much stronger (Feng et al., 2005). Environmental impacts have not been exclusively positive so far, and research suggests that afforestation with the wrong methods can have further negative environmental impacts. Although water runoff and soil erosion have been reduced in many areas (Deng et al., 2012; Liu et al., 2008), water shortages and further erosion has been linked to large scale afforestation in vulnerable arid and semi-arid regions (Cao et al., 2009a; Sun et al., 2006). Instead of planting tree seedlings, better customized restoration techniques such as planting of native steppe species, maximum water-use dwarf shrubs and even lichens are recommended in the context of arid areas (Cao et al., 2009a). Biodiversity improvements are limited due to the low diversity of the planted tree species (Liu et al., 2008).

Some of the lessons learnt are related to the need for a better articulation between different levels of government and for a longer timescale vision in order to maintain the current environmental gains (Xu et al., 2006a). There are indications that although the local population recognizes the need for environmental rehabilitation (Cao et al., 2009b), many gains would be reversed with the elimination of state subsidies (Hu et al., 2006).

END of Box 15.2

Target 16: Access to and sharing benefits from genetic resources

By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

Why this target is important:

The fair and equitable sharing of the benefits arising out of the utilization of genetic resources is one of the three objectives of the Convention on Biological Diversity. The Nagoya Protocol, adopted in 2010, provides a transparent legal framework for the effective implementation of this objective. The Protocol covers genetic resources and traditional knowledge associated with genetic resources, as well as the benefits arising from their utilization by setting out core obligations for its contracting Parties to take measures in relation to access, benefit-sharing and compliance. Bringing this Protocol into force and making it operational within countries is an important target for implementing the Strategic Plan on Biodiversity.

Summary of progress towards the target:

Target elements (by 2015)	Status	Confidence

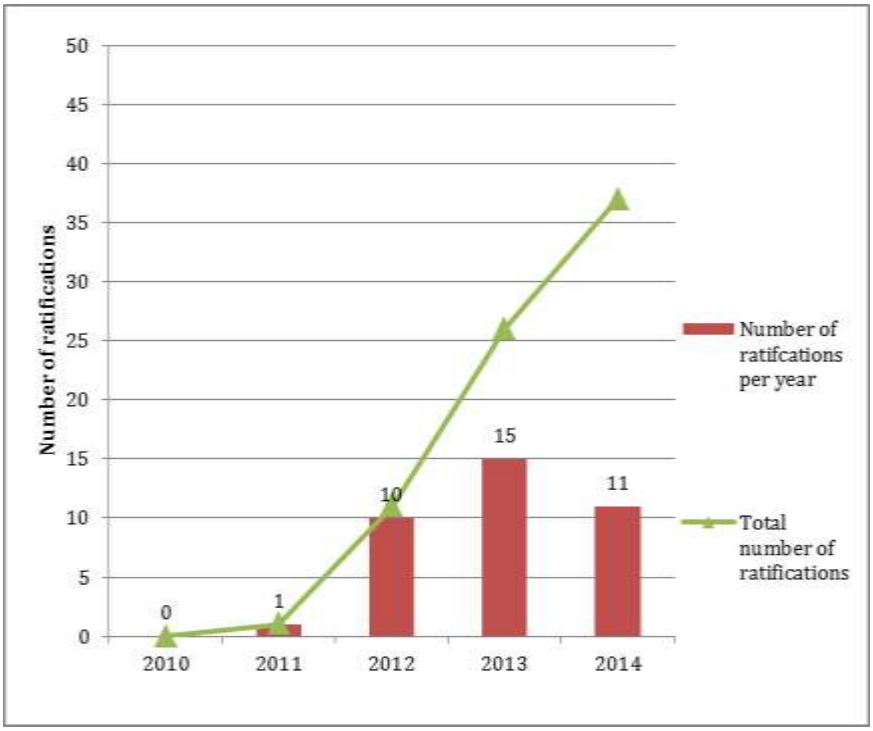
The Nagoya Protocol is in force	On track to exceed target	High
The Nagoya Protocol is operational, consistent with national legislation.	On track to achieve target	Medium

Storyline (recent trends, current status and future projections):

The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is expected to be in force before the end of 2015, thus meeting this target in advance of the deadline set (Figure 16.1). Currently (as of June 2014) 36 countries and the European Union have ratified the Protocol, meaning that only 14 additional ratifications are required for it to enter into force by the target deadline. This opens up new opportunities for benefits from biodiversity and ecosystem services to be more widely and fairly shared.

Examples are already available of agreements following the principles of the Nagoya Protocol, in which providers of genetic resources receive benefits arising from their use. There are also many examples of ABS agreements which grant indigenous and local communities benefits from the development of products and services derived from the use of their traditional knowledge concerning local plant and animal species (see Box 16,1).

A.



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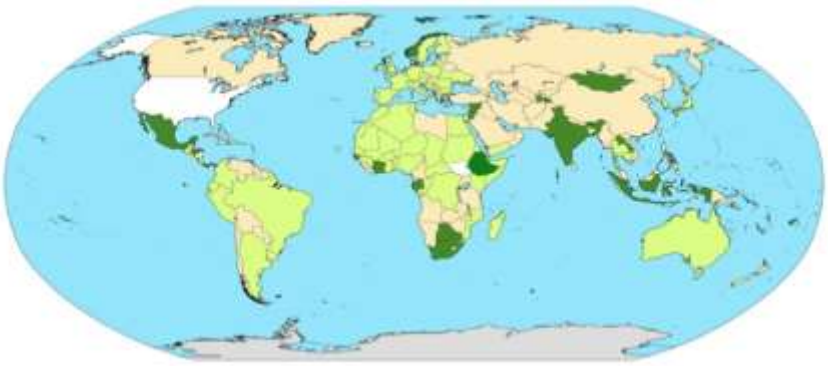


Figure 16.1. A) Ratifications of the Nagoya Protocol by year and **B)** countries that have ratified, approved or acceded to the Protocol (dark green) or have signed it (light green). Source: SCBD.

Actions to Enhance Progress Towards the Target:

The following actions would reinforce the successful achievement of Target 16;

- For countries that have not yet done so, to deposit the instrument of ratification, acceptance, approval or accession of the Nagoya Protocol as soon as possible to ensure full participation in the Protocol;
- Putting in place, by 2015, legislative, administrative or policy measures and institutional structures for implementing the Nagoya Protocol;
- Making national information available through the ABS Clearing House (see Box 16.2).
- Undertaking awareness raising and capacity building activities, including by engaging with indigenous and local communities and the private sector.

START Box 16.1: Access and benefit sharing in action: researching traditional bone-healing techniques in the Cook Islands

Dr Graham Matheson, a medical researcher brought up in the Cook Islands, observed the traditional application of plant-based extracts for treatment of bone fractures and other medical and therapeutic applications, by members of his community, friends and family. In 2003 he developed a proposal for the investigation and potential commercialization of medical and therapeutic remedies and cosmetic applications based on those plant extracts and reached a benefit-sharing agreement with the recognized indigenous representative body – the Koutu Nui. This led to the establishment of the company 'CIMTECH' which incorporates the Koutu Nui as a shareholder.

The Koutu Nui shareholding value is estimated to be at least $150,000. The research income to CIMTECH includes: $264,000 in grants received from the Australian Government, and $74,000 from University of New South Wales (UNSW). It also ncludes employment of 12 people on a part time basis in the Cook Islands, $560,000 in pre-seed investment in 2010 and a further $800,000 in 2011 for research and development. The project is expected to contribute to the local economy through the laboratory and processing facility in Raratonga, as well as through sales, marketing and tourism, including use of products in spas and hostels.

Matheson and CIMTECH have filed for a number of patents covering three distinct areas: bone and cartilage treatment, wound healing, and skin care treatments. Preliminary production and processing of essential oil solutions has begun and a skincare line called 'Te Tika" has been launched.

Source: UNSW/AusAID ABS Capacity Development Initiative

END BOX 16.1

START Box 16.2. The Access and Benefit-sharing Clearing-house.

Article 14 of the Nagoya Protocol establishes an ABS Clearing-House as part of the clearing-house mechanism of the Convention. The Secretariat of the CBD is currently implementing the pilot phase of ABS Clearing-House. Once fully operational, the ABS Clearing-House will serve as a means for Parties to share information related to access and benefit-sharing, including relevant legislative, administrative and policy measures, national focal points and competent national authorities, and permits or their equivalents, among other things. The ABS Clearing-House will play a key role in enhancing legal certainty and transparency and in promoting compliance. Having a fully functional ABS Clearing-House by the time of entry into force is essential for making the Protocol operational, and will significantly contribute towards achieving Aichi Target 16. The ABS Clearing-House is available at: https://absch.cbd.int/

END of Box 16.2.

Strategic Goal E

Enhance implementation through participatory planning, knowledge management and capacity-building

This goal within the Strategic Plan aims to create the enabling environment for the other targets to be effectively addressed. In this respect, an important and necessary step has been the drawing up and revising of national biodiversity strategies and action plans, which most countries will have completed by the target date of 2015. However, the level of implementation of these plans remains to be proven, and it will be crucial to use them as a way of turning the Aichi Biodiversity Targets into reality at national level. Respect for and inclusion of traditional knowledge in biodiversity action also remains variable, with some indicators suggesting a continued erosion of cultural diversity for example through the loss of indigenous languages. Important progress has been made in the sharing of and access to data, information and knowledge on biodiversity, but capacity to share and use that knowledge remains an obstacle. An overriding concern relating to the entire Strategic Plan is the lack of any sign of a substantial increase in resources towards its implementation.

Target 17: Biodiversity strategies and action plans

By 2015, each Party has developed, adopted as a policy instrument, and has commenced implementing, an effective, participatory and updated national biodiversity strategy and action plan.

Why this target is important:

National biodiversity strategies and action plans (NBSAPs) are the key instrument for translating the Convention on Biological Diversity and the decisions of its Conference of the Parties into national action. The attainment of this target would, therefore, facilitate the achievement of all of the Aichi Biodiversity Targets.

Summary of progress towards the target:

Target elements (by 2015)	Status	Confidence
Submission of NBSAPs to Secretariat by (end of) 2015	On track to meet target	Medium
NBSAPs adopted as effective policy instrument	Progress towards target but at an insufficient rate	Medium

NBSAPs are being implemented	Progress towards target but at an insufficient rate	Medium

Storyline (recent trends, current status and future projections):

For those Parties for which information is available, about 50% are expected to have completed their NBSAP by October 2014 and about 90% by the end of 2015. This part of the target is, therefore, expected to be met by the deadline.

However, the adequacy of available updated NBSAPs in terms of following the guidance set by the CBD's Conference of the Parties (COP) is variable. The degree to which countries are implementing their updated strategies and action plans is also variable, suggesting that while progress can be reported on these components of the target, they will not be achieved by 2015.

Table 17.1. A) Number of countries that have developed and revised NBSAPS and **B)** effectiveness of updated NBSAPS (as at 10 April 2014)

A.

n=194	Parties that have developed at least one NBSAP	Parties that have not developed an NBSAP	Parties that have revised NBSAP at least once	Parties that currently have NBSAP targets whose timelines[2] extend to 2014 or beyond.
NBSAP developed	179	15	45	57

B.

n=26	Updated NBSAPs containing national targets		Updated NBSAPs clearly linking national targets to Aichi Biodiversity Targets	Updated NBSAPs containing indicators[3]		NBSAP supported (or plan to be) by monitoring system
	Yes	No		Yes	No	
Effectiveness of NBSAP	22	4	8	10	10	21

Actions to Enhance Progress Towards the Target:

The following actions would reinforce the successful achievement of Target 17:

- Ensuring that the NBSAP is adopted as an effective policy instrument recognized across the whole of government;
- Ensuring that the NBSAP is up to date and aligned with the Strategic Plan for Biodiversity 2011-2020, for example by setting national targets with corresponding indicators and monitoring

2 Includes pre- and post-2010 NBSAPs
3 6 of these do not provide enough information to determine.

mechanisms, and keeping it under review once it has been developed and is being implemented, with the participation of all stakeholders; and

- Ensuring that the necessary institutional structures are in place to implement the NBSAP, including a mechanism for inter-ministerial and inter-sectoral coordination, and mechanisms to secure the necessary human and financial resources.

START Box 17.1. Examples of processes to revise national biodiversity strategies and action plans (NBSAPs)

Japan – Japan's NBSAP was finalized in September 2012. An inter-ministerial committee drafted the revised NBSAP and the Central Environmental Council conducted Interviews with sectors including NGOs, businesses and local authorities, local briefings and consultation meetings were organized on this draft. Public comments on the draft NBSAP were invited prior to it being finalized.

Suriname – Suriname's NBSAP was finalized in February 2013 and was based on National Biodiversity Strategy (NBS) finalized six years earlier. A variety of ministries were involved in the development of the NBSAP, including the Ministries of Labour, Technological Development and Environment (ATM), of Physical Planning, Land and Forest Management (ROGB) and of Agriculture, Animal Husbandry and Fisheries (LVV) among others. Experts in different sectors were consulted in on the relevance and especially the feasibility of the proposed actions. Prior to finalizing the NBSAP a validation workshop was held

Cameroon – As part of the process of revising its NBSAP, the country undertook country studies and stocktaking exercises which, among other things, analysed gaps between the previous NBSAP and the current situation in the country, identified the causes and consequences of biodiversity loss in Cameroon and explored the specific contributions that NGOs have made to biodiversity.
END of BOX 17.1

Target 18: Traditional knowledge

By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.

Why this target is important:

Traditional knowledge contributes to both the conservation and the sustainable use of biological diversity. This target aims to ensure that traditional knowledge is respected and reflected in the implementation of the Convention, subject to national legislation and relevant international obligations, with the effective participation of indigenous and local communities. Given the cross cutting nature of this target, actions taken to fulfill it will contribute to several of the other Aichi Biodiversity Targets and the Nagoya Protocol.

Summary of progress towards the target:

Target elements (by 2020)	Status	Confidence
Traditional knowledge, innovations and practices of indigenous and local communities are respected	Progress towards target but at an insufficient rate	Medium
Traditional knowledge, innovations and	Progress towards target but at an insufficient	Low

practices are fully integrated and reflected in implementation of the Convention …	rate	
… with the full and effective participation of indigenous and local communities	Progress towards target but at an insufficient rate	Low

Storyline (recent trends, current status and future projections):

Processes are under way internationally and in a number of countries to strengthen respect for, and recognition and promotion of, traditional knowledge and customary sustainable use. Efforts to enhance the capacities of indigenous and local communities to participate meaningfully in relevant processes locally, nationally and internationally are progressing, but limited funding and capacity remain obstacles.

Overall, traditional knowledge continues to decline as illustrated by the loss of linguistic diversity (see Figure 18.1 and Box 18.1) and large-scale displacement of indigenous and local communities to urban areas. However, this trend is reversed in some places through growing interest in traditional cultures and involvement of local communities in management of protected areas.

Around half of national reports assessed for GBO4 indicate progress towards this target, with actions including support for traditional natural resources management (Japan, Myanmar, South Africa) and participatory management of forests and protected areas (Nepal).

While progress has been made in all components of this target, current trends as far as they can be assessed suggest that the actions taken to date have been **insufficient to achieve the target by 2020**.

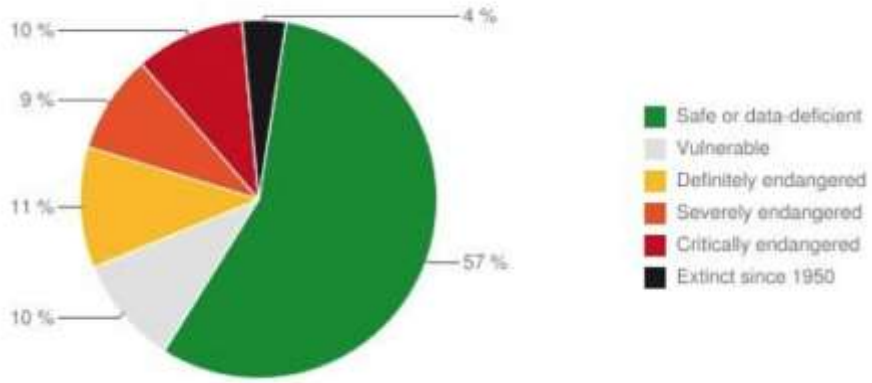


Figure 18.1. Level of threat to the world's languages. According to UNESCO's *Atlas of World Languages in Danger*, at least 43 per cent of languages are in danger of disappearing, based on the degree of transmission between generations. Source: UNESCO (2011).

Actions to Enhance Progress Towards the Target:

The following actions would help to accelerate progress towards Target 18. They would also contribute to other targets, shown in parentheses.

- Developing national guidelines, aligned with relevant guidance under the CBD, on recognizing and safeguarding the rights of indigenous and local communities over their knowledge;
- Promoting local initiatives that support traditional and local knowledge of biodiversity and promote customary sustainable use, including traditional health care initiatives; strengthening opportunities to learn and speak indigenous languages; research projects and data collection based on traditional

methodologies (*Target 19*); and involving local and indigenous communities in creation, control and management of protected areas (*Target 11*);

- Raising awareness of the importance of traditional knowledge to conservation and sustainable use of biodiversity (Tar*get 1*);
- Supporting and cooperating in the organization of capacity-building activities on relevant issues under the Convention for indigenous and local communities, as well as cultural awareness raising programmes; and
- Promoting effective participation of indigenous and local communities, at all levels, in issues related to biodiversity and of interest to them.

START Box 18.1: - Risk to indigenous languages in the Arctic.

Twenty-one northern languages have become extinct since the 1800s and ten of these extinctions have taken place since 1990, indicating an increasing rate of language extinction. Of these extinctions, one was in Finland, one in Alaska, one in Canada and 18 in the Russian Federation. Twenty-eight languages classified as critically endangered are in dire need of attention before they, too, are lost forever.

Over 70% of the northern indigenous languages are spoken only in single countries, and so are particularly exposed to the policies of a single government bringing with it the potential for more effective conservation.

Revitalization efforts of various kinds are taking place throughout the North and are strong testimony to the interest of indigenous peoples in revitalizing and promoting their languages. Revitalization programs are largely grassroots movements with a variety of activities, such as intensive summer school programs, language use in local schools and special courses aimed at adult learners.

Figure 18.2. Status of languages among linguistic families in the Arctic region. Source: Arctic Biodiversity Assessment (2013), UNESCO.

END of Box 18.1

START Box 18.2. Monitoring of traditional knowledge in the Philippines

Indigenous Kalanguya communities in Tinoc, Ifugao Philippines have been revitalizing customary land use and territorial management using culturally-defined ecosystems-based approaches. Tinoc is one of the pilot communities of the Philippine Traditional Knowledge Network (PTKN) where community-based monitoring of traditional knowledge is being conducted using multiple indicators, e.g. on linguistic diversity, traditional occupations, land tenure and land use change.

Data generated includes cultural mapping of multiple land and forests uses, documentation of customary tenure systems, traditional occupations, status of traditional knowledge holders and cultural transmission. The status of flora and fauna, productivity of major crops and soil fertility has also been investigated. Some findings include: contraction of watershed forests to 60% of their size in 1970 due to conversion to vegetable farming and up to 30-50% decline in rice yields due to weakening of traditional knowledge on soil enhancement practices as well as increased pest damage due to veering away from traditional pest control like synchronized farming activities.

The information gathered through the project are being used to stimulate community actions on conservation, sustainable use and customary governance over lands, forests and waters. Plans have been developed for revitalizing traditional knowledge and strengthening customary practices and law, including biodiversity management plans and demarcation of protected watershed areas and to strictly control the privatization of common lands critical for community wellbeing and biodiversity, to assist in forest regrowth, and to shift from chemical-input farming to ecological/sustainable farming. The information has been shared with local and national government. It has led to the adoption of a covenant (by the local community and local government) to arrest environmental degradation and promote peoples' wellbeing through the revival of indigenous knowledge practices and systems of territorial management.

Drawing on pilots such as in Tinoc, the Philippine Traditional Knowledge Network (PTKN) and Tebtebba Foundation submitted a list of traditional occupations to the Philippine National Statistical Coordination Board (PNSCB) for consideration in the revision process of the Philippine Standard Classification of Occupations (PSOC), resulting in the incorporation of some of the submitted traditional occupations. The PTKN also coordinated with the National Focal Point of the CBD about updating the NBSAP and associated TK indicators.

Source: Forest Peoples Programme.

END of Box 18.2

Target 19: Sharing information and knowledge

By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.

Why this target is important:

Biodiversity-related information is vital to identify threats to biodiversity and determine priorities for conservation and sustainable use. Given this, progress towards this target can contribute to the attainment of the other Aichi Biodiversity Targets. This target is a general commitment to increase the amount and quality of biodiversity relevant information and technologies available, to make better use of these in decision making, and to share them as widely as possible.

Summary of progress towards the target:

Target elements (by 2020)	Status	Confidence
Knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved	On track to meet target	High
Biodiversity knowledge, the science base and technologies are widely shared and transferred and applied	Progress towards target but at an insufficient rate	Medium

Storyline (recent trends, current status and future projections):

Data and information on biodiversity are being shared much more widely through a range of national, regional and global initiatives. They include networks to promote and facilitate free and open access to digitized records from natural history collections and observations, including through citizen science initiatives; collaboration to build a complete catalogue of the world's species; and the development of 'DNA barcoding' as a means of identifying species (Figure 19.1).

However, much data and information remain inaccessible and capacity is lacking to mobilize them in many countries.

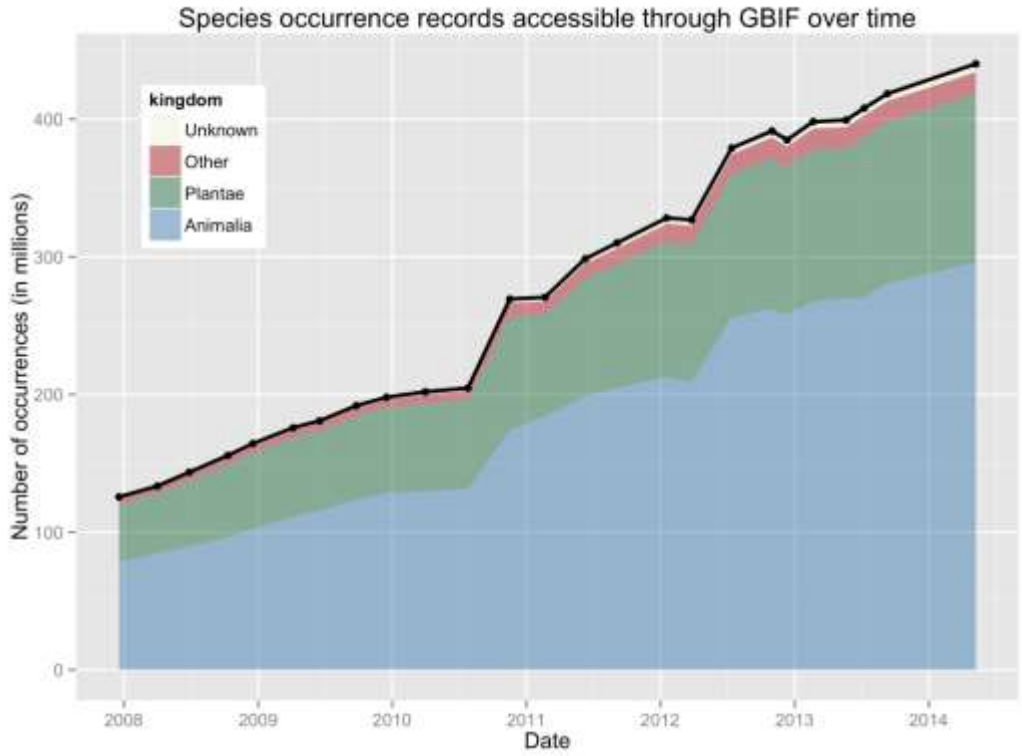
The need for more coordinated efforts to monitor biodiversity, using standard or harmonized protocols is recognized in the work of the Group on Earth Observations Biodiversity Observation Network (GEO BON), envisaging a global network to link *in situ* and remotely sensed information. GEO BON is developing a set of Essential Biodiversity Variables (EBVs) aimed at improving the efficiency of monitoring by focussing observations on a limited number of key attributes.

Knowledge on biodiversity has advanced tremendously in the past 20 years, and networks such as DIVERSITAS have helped to bring scientists together to collaborate on research of relevance to society and decision making. This process is further enhanced with the establishment of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), whose programme of assessments, knowledge generation, capacity building and policy tools aims to enable better informed decisions at all scales.

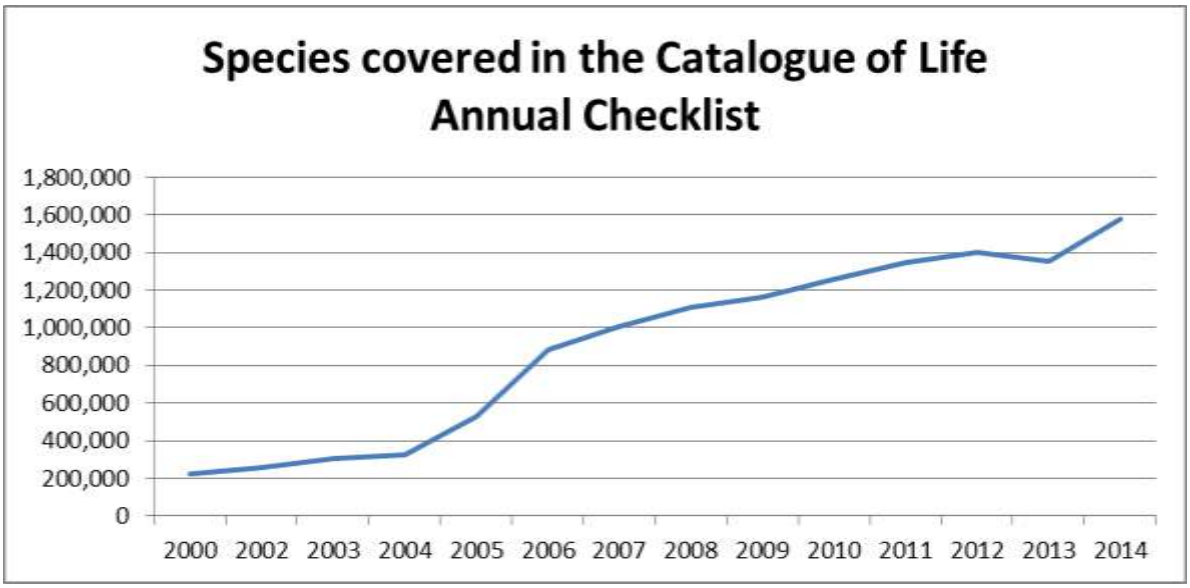
Countries have made considerable investments in improving national information and monitoring systems on biodiversity, and in international data-sharing infrastructures such as the Global Biodiversity Information Facility.

With the advances made in building systems to share data, information and knowledge on biodiversity, **a significant part of this target is judged by GBO4 to be on track.** However, to meet all components of the target, **further efforts are needed on investment in data mobilization and the coordination of models and technologies that can be readily applied to decision making.**

A.


Species occurrence records accessible through GBIF over time
kingdom
Unknown
Other
Plantae
Animalia
Number of occurrences (in millions)
0
100
200
300
400
2008
2009
2010
2011
2012
2013
2014
Date

B.


Species covered in the Catalogue of Life
Annual Checklist
1,800,000
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
2000 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014

C.

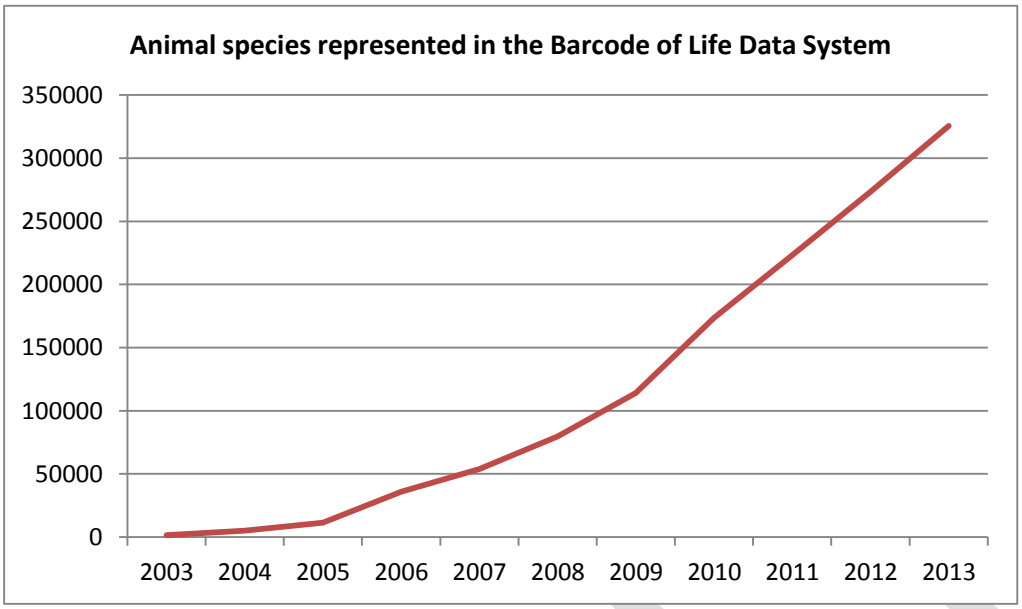


Figure 19.1.A. Growth in a. Species occurrence records published through the Global Biodiveristy Information Facility (www.gbif.org) ; **B.** Species covered in the Catalogue of Life annual checklist (http://www.catalogueoflife.org) and C. Number of animal species represented in the Barcode of Life Data System global reference library (http://www.boldsystems.org) . *Sources: GBIF (Tim Robertson), CoL, BOLD.*

Actions to Enhance Progress Towards the Target:

The following actions would help to accelerate progress towards Target 19. They would also contribute to other targets, shown in parentheses.

- Developing inventories of existing biodiversity information as a means of identifying knowledge gaps and defining research priorities, and making greater use of existing national and international research networks to help address these;
- Strengthening and promoting the further mobilization of and access to data by, for example, encouraging the use of common informatics standards and protocols, promoting a culture of data sharing (for example, through requirements on publicly-funded research projects and academic recognition for publication of datasets), investing in digitization of natural history collections and promoting citizen scientists' contributions to the body of biodiversity observations (see Box 19.1);
- Facilitating the use of biodiversity related information by decision makers at national and local levels;
- Establishing or strengthening monitoring programmes, including monitoring of land-use change, providing near-real time information where possible, in particular for "hotspots" of biodiversity change, and incorporating standardized concepts such as Essential Biodiversity Variables (EBVs);
- Engaging local and indigenous communities (Target 18) as well as relevant stakeholders in information collection and use;
- Supporting communities of practice and stakeholders in relevant skill fields, and strengthening cooperation among relevant national institutions, national and regional centres of expertise in biodiversity; and other relevant stakeholders and initiatives; and

- Improving national, regional and international Clearing House Mechanisms, strengthening thematic information-based services and establishing interconnections in order to contribute to the development of a global biodiversity knowledge network.

START Box 19.1: The Global Biodiversity Informatics Outlook: Delivering biodiversity knowledge in the information age.

The Global Biodiversity Informatics partnership has developed the Global Biodiversity Informatics Outlook (GBIO) as a framework and concept to promote mobilization, access, use and analysis of primary data and distilling policy-relevant information. It identifies the need for organized activity based on four focus areas:

- Creating a **culture** of shared expertise, robust common data standards, policies and incentives for data sharing and a system of persistent storage and archiving of data.
- Mobilizing biodiversity **data** from all available sources, to make them promptly and routinely available. Data should be gathered only once, but used many times. This includes data in all forms from historic literature and collections to the observations made by citizen scientists; from the readings of automated sensors to the analysis of the genetic signatures of microbe communities.
- Providing the tools to convert data into **evidence** by enabling those data to be discovered, organizing them into views that give them context and meaning. This includes major collaborative efforts to improve the accuracy of data and their fitness to be used in research and policy; to provide a taxonomic framework; and to organize information about the traits of species and the interactions between them.
- Generating **understanding** of biodiversity and our impacts upon it, by applying the evidence in models, tools for visualization and identifying gaps to prioritize future data gathering.

Source: GBIO (www.biodiversityinformatics.org)
END of Box 19.1:

START Box 19.3. Sharing information on the forests of the Congo Basin: Observatoire des Forêts d'Afrique Centrale (OFAC)
In Central Africa, data availability about the state of the forests and the forest biodiversity has always been a critical issue. Under the authority of COMIFAC (*Commission Ministérielle des Forêts d'Afrique Centrale*), the OFAC (*Observatoire des Forêts d'Afrique Centrale*) is a unique regional observatory to monitor forest resources (10 countries, 187,000,000 ha of rain forests). OFAC annually collects, verifies and harmonizes general data on forests through a network of partners and disseminates information through a web-based information system (http://observatoire-comifac.net/index.php). These data are analysed by experts to produce the "State of the Congo Basin Forests" reports (SOF), including information on forest cover, biodiversity and other issues. Recently OFAC became part of the global Digital Observatory for Protected areas (DOPA) (http://dopa.jrc.ec.europa.eu/) conceived as a set of 'critical biodiversity informatics infrastructures' to provide users such as park managers, decision makers and observers with the means to assess, monitor and possibly forecast the state of and pressures on protected areas at the global scale.
END of Box 19.3.

Target 20: Mobilizing resources

By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels.

This target will be subject to changes contingent to resources needs assessments to be developed and reported by Parties.

Why this target is important:

The overall objective of this target is to increase the amount of resources available to implement the Strategic Plan for Biodiversity. The fulfillment of this target will have implications on the feasibility of achieving the other 19 targets contained in the Strategic Plan.

Summary of progress towards the target:

Target element (by 2020)	Status	Confidence
Mobilization of financial resources implementing the Strategic Plan for Biodiversity from all sources have increased substantially from 2010 levels	Progress towards target but at an insufficient rate	Low

Storyline (recent trends, current status and future projections):

Based on recent trends in the data available, financial resources towards implementation of the Strategic Plan for Biodiversity 2011-2020 will not have increased substantially during the current decade.

There is limited information on domestic funding in support of the Strategic Plan. The most recent pledges of funding through the Global Environment Facility (GEF-6) show a modest increase, and there has been a general increase in biodiversity-related official development assistance (ODA) against the 2006-2010 baseline. However, the most recent figures show evidence of decline in this funding.

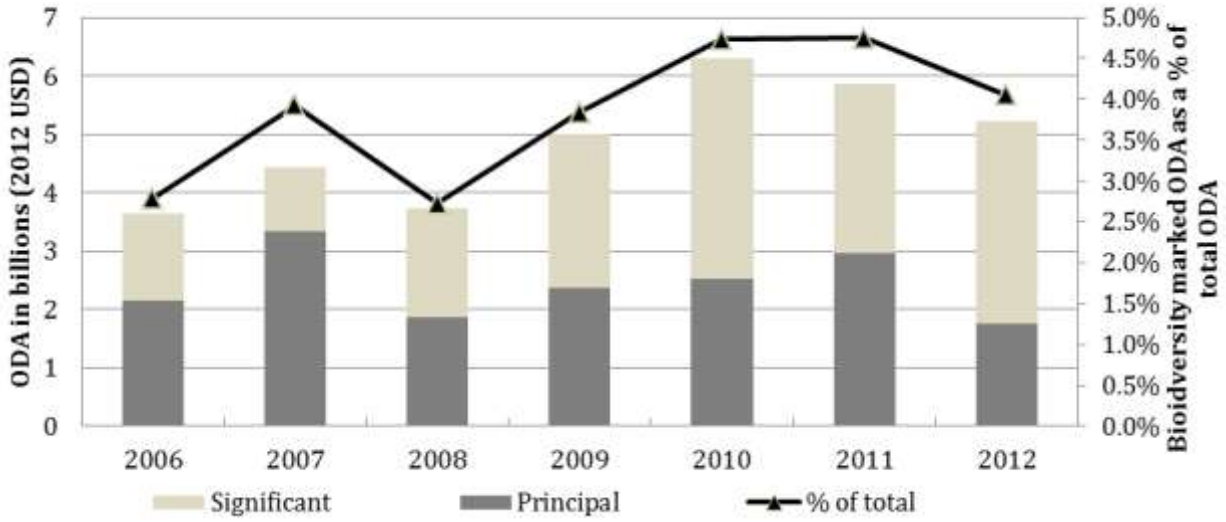


Figure 20.1. Biodiversity marked official development assistance (ODA) between 2006 and 2012 in billions of USD (2012 constant prices) and as a percentage of total ODA. *Source: OECD Creditor Reporting System - Data extracted on 27 May 2014 from OECD.Stat.*

Actions to Enhance Progress Towards the Target:

The following actions would help to accelerate progress towards Target 20. They would also contribute to other targets, shown in parentheses.

- Articulating the various values of biodiversity for the economy and society through national, and where relevant, sub-national, assessments (*Targets 1 and 2)* This should include assessment of the co-benefits of investments in biodiversity, and of the long-term costs of inaction;
- Developing national financial plans for biodiversity, as part of NBSAPs (*Target 17*), aligned, where possible, with national annual and multi-annual financial planning cycles. The plans should clearly identify funding needs, gaps and priorities to allow for more targeted resource use;
- Integrating biodiversity in national development plans and/or national plans for development cooperation (*Target 2*); and
- Broadening biodiversity funding sources including by exploring innovative financial mechanisms, such as subsidy reform and payment for ecosystem services schemes, recognizing that no single source of funding will be sufficient to meet the full needs (Box 20.1).

START Box 20.1. Raising resources through environmental payments: Water fund in Cauca Valley, southwestern Colombia. (source: High Level Panel report, TEEB).

Valle del Cauca (Cauca Valley) is a high productive and fertile region, with a huge number of sugarcane producers, an important export and domestic crop for the country. This region lies in a very rich hydrological system containing important watersheds supplying water to 900,000 people residing in the cities, including the city capital Cali. This region is quite sensitive to climate factors causing water scarcity during the summer. A ***water fund*** was implemented to secure biodiversity and water-related services benefits, particularly reduction in sedimentation and maintenance of water flows. Activities carried out through investments by the fund include conserving at least 125,000 hectares of the natural ecosystems and improving management of the landscape. These activities will benefit 920,000 people downstream and sugar cane production, an important industry for the Colombian economy (TEEBcase 2012).

END of Box 20.1

START Box 20.2. Evidence of funding gaps in Europe

The costs for meeting **the United Kingdom**´s environmental targets for "biodiversity, landscape, climate change mitigation, flood risk management, farmland historic environment, soil quality, water quality, resource protection and public access" was estimated based on the established UK targets and current agri-environment payment rates, and assumes management on all 16,2 million hectares of agricultural and forestry land in the UK. The total costs are estimated to reach €1.986 billion per year [US$ 2.906 billion per year], which is three times the existing annual agri-environment budget. It is stated, furthermore, that costs are probably significantly underestimated.

In **Moldova**, the implementation of the "Action Plan on Biodiversity Conservation" (implemented over a period of 10 years, from 2002 onwards) is estimated to cost 87 million Lei (US$18.7 million) in total, or 12 million Lei (US$2.6 million) per year, representing 0,14% of the national GDP. However, the current expenditure on biodiversity conservation from all financing sources sum up to around 29 million Lei (US$6.3 million), representing 0.3% of the GDP.

In **Switzerland**, a recent study estimated the financial resources required for the protection and maintenance of biotopes of national importance according to legal standards (which could be interpreted as Aichi requirements), and concluded that the yearly sum allotted presently by the Confederation and the cantons covers not even half the amount of funding necessary (the amount required would be CHF 148 - 183 million per year) [US$ 172.4 – 213.2 million per year]. In addition, a one-time investment in restoration measures would be needed (700 to 1.500 million CHF) [US$ 815 - 1.748 million]. The study concluded that it is impossible to satisfy legal requirements with the existing level of funding.

In **Serbia**, the funding allocated to managing the protected areas of the country are at only 25% of what is needed - a doubling of the spending would be necessary to cover basic functioning costs, a tripling for optimal functioning - in other words: the annual shortfall in protected areas financing in Serbia amounts to around US$ 8.7 million for basic costs (50% shortfall) and US$ 24.7 million for optimal functioning (75% shortfall).

In **Russia**, the total budget of the country's actions addressed directly to the implementation of the CBD requirements amounts to no more than 270.300 billion rubles (US$4.5 billion) annually - 2,4 times less than required for maintaining the biodiversity conservation in the country, impacting mainly on protected areas, rare species conservation, practical implementation of information technologies, ecological education and setting up of the monitoring system for tracking the biodiversity status (i.e. several important enabling activities).

Source: High-Level Panel on Global Assessment of Resources for Implementing the Strategic Plan for Biodiversity 2011-2020

END of BOX 20.2

PART III – SYNTHESIS

(1) SUMMARY OF PROGRESS TOWARDS THE GOALS OF THE STRATEGIC PLAN AND THE AICHI BIODIVERSITY TARGETS

This chapter provides an overall assessment of progress towards the implementation of the Strategic Plan for Biodiversity 2011-2020 on the basis of (1) extrapolations of current trends towards the five goals of the Strategic Plan according to a set of indicators, and (2) information provided by Parties in the fifth national reports on progress towards the Aichi Biodiversity Targets, including Parties' self-assessments of progress. The overall assessment of progress towards the elements of the Aichi Biodiversity Targets provided in the preceding sections, and collated in the "dashboard" included in the Executive Summary (UNEP/CBD/SBSTTA/18/2), also draws upon the analysis in the chapters of the technical report as well as targets and actions provided in updated national biodiversity strategies and action plans*

Extrapolations of Current Trends

Several of the target assessments in the previous section of this Outlook include graphs showing extrapolation of trends in indicators to 2020, based on past data and using statistical techniques to take the projection forward to the date when most Aichi Biodiversity Targets have their end point. These are not predictions, as they assume that all the drivers remain constant, and they cannot take account of possible changes in policies or behaviour. However, they give an indication of where some trends are likely to lead, if recent drivers and current practices continue without change.

In all, 55 indicators were chosen that had relevance to the 20 Aichi Biodiversity Targets.
Figure 21.1 shows a synthesis of all of these indicators, grouped according to the Strategic Goals and whether they represent the actual state of biodiversity, the pressures upon biodiversity or policy responses. The overall message of these indicators remains similar to the situation analysed in GBO3: in general, positive responses to biodiversity issues are increasing (19 out of 32 response indicators); but indicators of pressures on biodiversity also show a projected increase (six out of seven pressure indicators); and projections of the state of biodiversity show a significant deterioration (13 of 16 state indicators) between 2010 and 2020 – all assuming that current drivers remain constant.
Across the five strategic goals, the messages of these extrapolations can be summarized as follows:

Strategic Goal A (Addressing underlying causes)

The targets in this goal focus mainly on responses to the underlying drivers of biodiversity loss. The response indicators relating to Goal A, for example on measures to promote sustainable consumption and production, show a positive trend. However, the extrapolations show a continuing increase in all of the indicators of pressures relating to the goal: the ecological footprint, the water footprint and human appropriation of net primary productivity (the proportion of the planet's plant growth used by people). These contrasting trends may indicate time lags in the impacts of positive changes – or that moves towards sustainable practices are still outweighed by contrasting pressures.

* However, in the current draft, this is limited since, to date, only 25 updated NBSAPs are available. In the final version of the report this section will also take into account national targets and proposed actions contained in NBSAPS ().

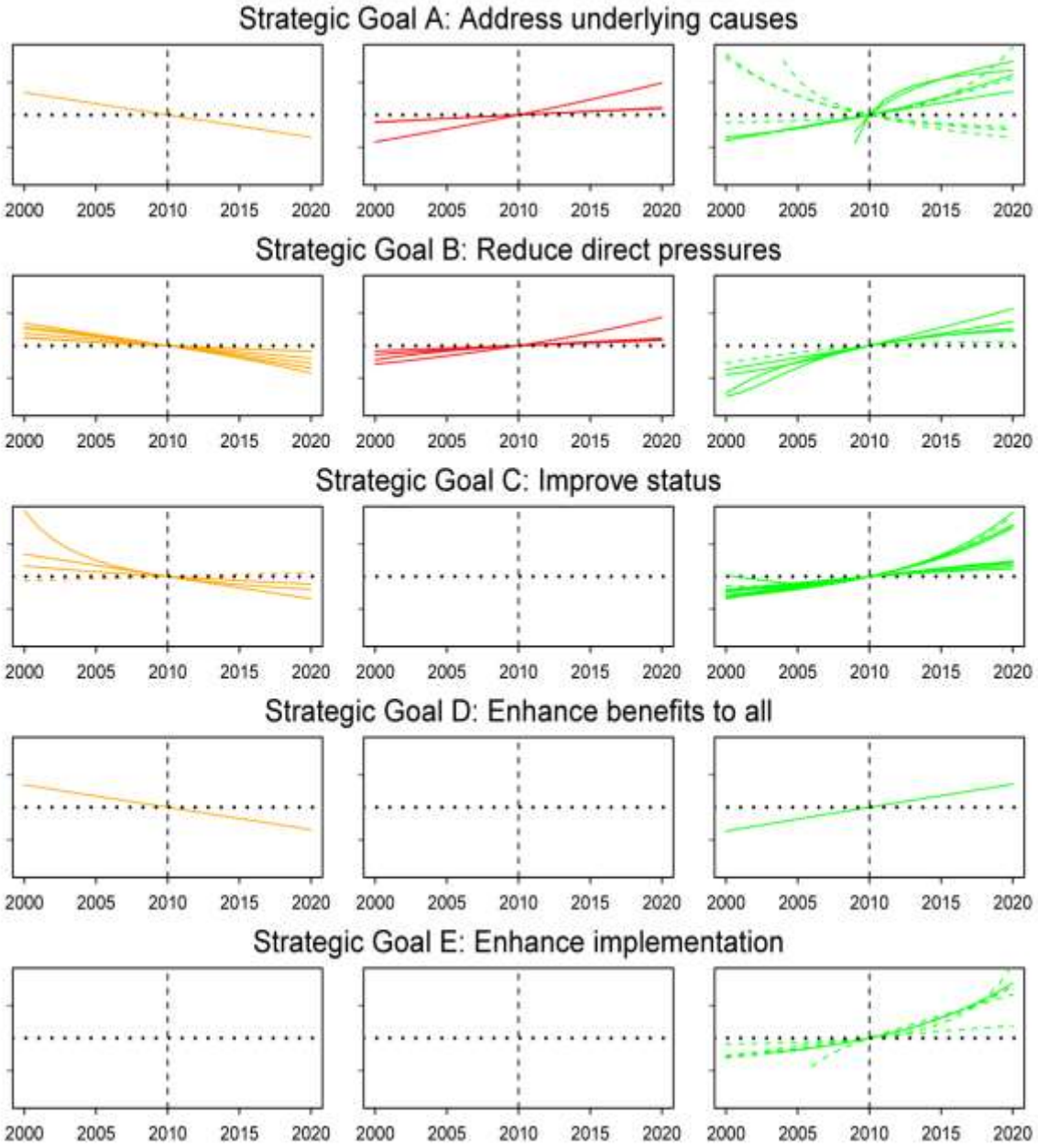


Figure 21.1. Trends in indicators from 2000 and projected to 2020 for the five different Aichi Strategic Goals; State measures are coloured orange, Pressure measures are coloured red, and Response measures are coloured green. The horizontal dotted line represents the modelled indicator value in 2010. For state and response indicators, a decline over time represents an unfavourable trend (falling biodiversity, declining response) whereas for the pressure indicators a decrease over time represents a favourable trend (reducing pressure). A dashed coloured line represents no significant trend, whereas a solid coloured line represents a significant projected change between 2010 and 2020. Source: UNEP-WCMC.

Strategic Goal B (Reducing direct pressures)

Indicators within this goal also show the contrast between improving responses, increasing pressures and declining state of biodiversity. While certification of sustainability is increasingly being used for forest products and fisheries, pressures of fishing effort, nitrogen use and invasive species are all projected to increase until 2020. Eleven separate measures of the state of habitats and species relating to this goal show a continuing decline.

Strategic Goal C (Improve status of biodiversity)

Two indicators of the state of biodiversity within this goal, the Living Planet Index and the Red List Index, both show current declines and an extrapolation of continuing decline to 2020 based on current drivers. On the other hand, responses with positive trends include the coverage of protected areas, including their effectiveness, ecological representativeness, and degree of protection for key biodiversity sites.

Strategic Goal D (Enhance benefits)

Very few quantitative indicators directly cover the targets within this strategic goal. The only indicator directly relevant to this Strategic Goal that was available for this assessment is the Red List Indicator for pollinators which showed that these species are on average moving closer towards extinction, suggesting that this ecosystem service is in decline. However there are some indicators for the other Strategic Goals that provide evidence of progress towards the targets under this Strategic Goal. These include indicators relating to habitat extent, fishing and other pressures. The current status of these indicators suggests that ecosystems and the service they provide are in decline and are projected to continue decline up to 2020.

Strategic Goal E (Enhance implementation)

All indicators used for this goal related to responses: on availability of data and knowledge, funding for conservation and development assistance. All of these showed recent increases and projected increases to 2020.

Conclusions

These indicators serve to complement rather than substitute the more comprehensive assessments summarized in the previous section. The set of indicators is more comprehensive than those available for GBO3, although they provide only a partial picture of progress towards the Aichi Biodiversity Targets. The overall message of the indicators, and their statistical extrapolations to 2020, is that the impacts of responses supporting biodiversity conservation and sustainable use cannot yet be discerned in the form of reduced pressures or improved state of biodiversity – and that actions therefore need to be stepped up and accelerated if the goals of the Strategic Plan are to be achieved.

Information from the Fifth National Reports

The fifth national reports that have been submitted and assessed (50 in total) provide a complimentary line of evidence of the progress that has been made towards the attainment of the Aichi Biodiversity Targets. An assessment of these reports reinforces the overall assessment that while progress is being made towards the achievement of all targets, it is insufficient on current trajectories to meet the targets by the 2015 and 2020 deadlines (see Figure 21.2). Also, consistent with the results from the indicators, the information in the national reports suggests that most progress has been made in relation to Aichi Biodiversity Targets 11, 16 and 17, while progress is limited for targets 3 and 10, in particular.

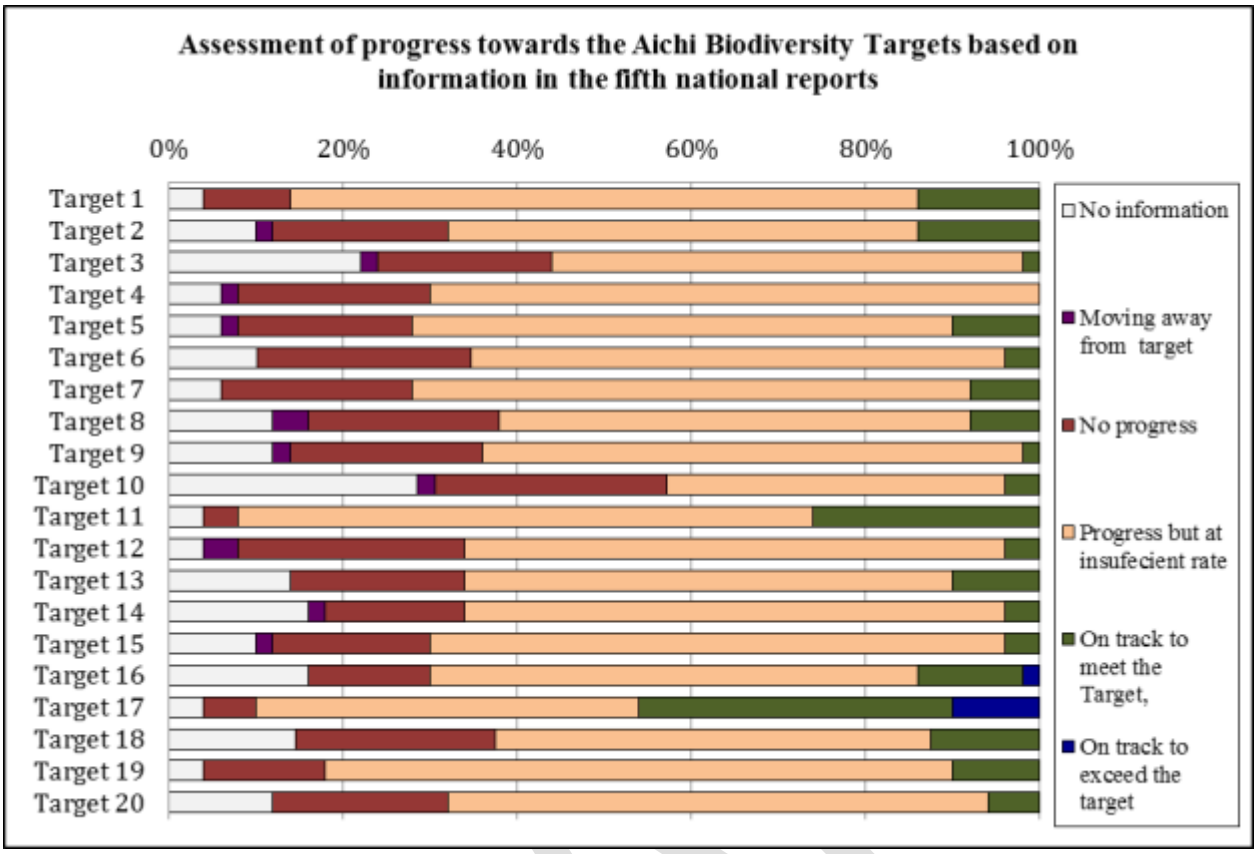


Figure 21.2 – Assessment of progress towards the attainment of the Aichi Biodiversity Targets based on the information contained in 50 fifth national reports[4]. Note that approximately 60% of these reporting countries have explicitly assessed their national progress towards the Aichi Biodiversity Targets in their reports. Where this is the case the country's assessment has been applied to the same five point scale used in the dashboard summary contained in the executive summary of the report (UNEP/CBD/SBSTTA/18/2). In the other cases the assessment has been inferred from the information contained in the report. A number of these reports did not contain information that allowed for an assessment of progress; This is noted in the figure as "No Information"

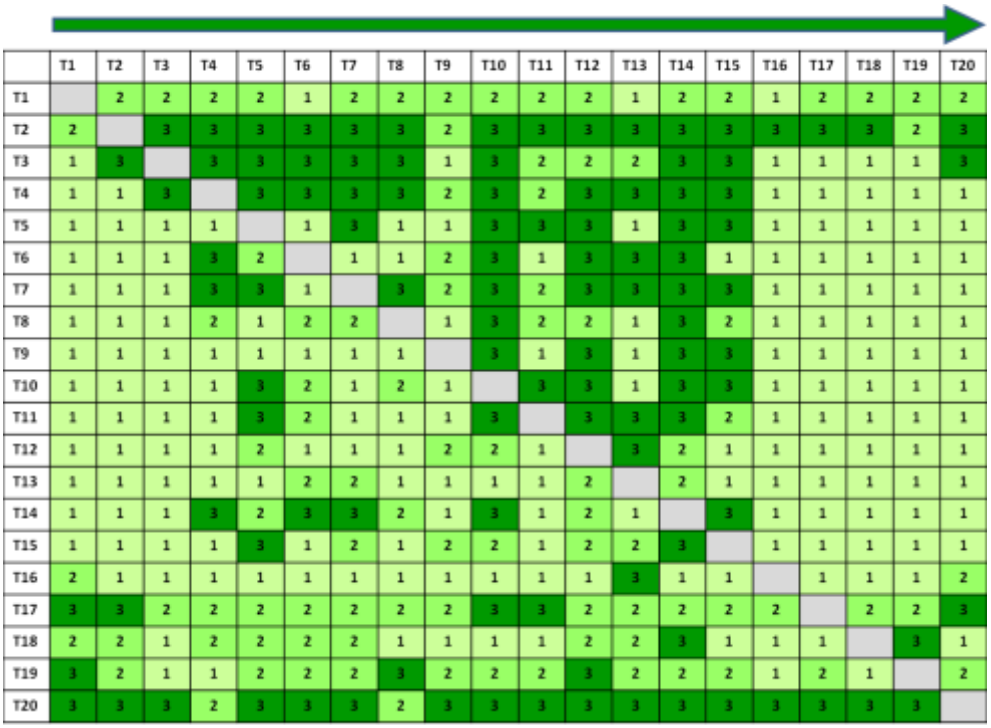
(2) INTERACTIONS AMONG THE AICHI BIODIVERSITY TARGETS, AND TIME LAGS

The Aichi Targets are deeply inter-connected but the relationships among targets vary in strength and are often asymmetric (see Figure 21.3). It is useful to consider these interactions when designing national actions to implement the Strategic Plan for Biodiversity 2011-2020. Coordinated actions that maximize the positive interactions amongst targets can potentially reduce the overall costs of implementation of a NBSAP and optimize its implementation and execution time.

4 This assessment is preliminary and will be updated as additional fifth national reports are reviewed. The current assessment draws on information in the reports of the following countries: Azerbaijan, Belgium, Bosnia and Herzegovina, Burundi, Cameroon, Canada, China, Colombia, Congo, Costa Rica, Cote D'Ivoire, Cuba, Denmark, Dominica, Ecuador, Estonia, Ethiopia, Finland, Germany, Hungary, India, Iraq, Italy, Japan, Madagascar, Malaysia, Mongolia, Myanmar, Namibia, Nauru, Nepal, Netherlands, New Zealand, Niger, Nigeria, Niue, Pakistan, Palau, Poland, Rwanda, Senegal, Solomon Islands, Somalia, South Africa, Spain, Sudan, Tonga, Uganda, United Kingdom of Great Britain and Northern Ireland, and United Republic of Tanzania.

Some targets mostly have impacts on other targets (downstream interactions), while others are primary impacted by other targets (upstream interactions). In particular, actions taken within targets 17 (Adoption of NBSAPs), 19 (Knowledge Base), 20 (Financial Resources), 2 (Biodiversity Values), 3 (Incentives) and 4 (Production and Consumption) are considered to have large effects on other targets. These targets, under Strategic Goal A and E, should therefore be seen as strategically important because they influence the achievement of a broad range of Targets and Strategic Goals.

On the other hand, achieving target 5, and thereby addressing the currently largest pressure on terrestrial biodiversity loss, will require a concerted approach that draws upon actions under most of the other targets. For example, as set out under the chapter on target 5, a strategy to reduce deforestation or other land use change might require: public awareness and engagement (Target 1), a legal or policy framework for land use or spatial planning (Target 2), incentives measures, both positive and negative, (Target 3), addressing commodity supply chains to restrict products from illegal or unsustainable sources (Target 4), promoting sustainable increases in the productivity of existing agricultural land and rangeland (Target 7), developing protected area networks (Target 11); engaging with indigenous and local communities (target 18), monitoring land use and land-cover (Target 19), and mobilizing resources (Target 20).



	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20
T1		2	2	2	2	1	2	2	2	2	2	2	1	2	2	1	2	2	2	2
T2	2		3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	2	3
T3	1	3		3	3	3	3	3	1	3	2	2	2	3	3	1	1	1	1	3
T4	1	1	3		3	3	3	3	2	3	2	3	3	3	3	1	1	1	1	1
T5	1	1	1	1		1	3	1	1	3	3	3	1	3	3	1	1	1	1	1
T6	1	1	1	3	2		1	1	2	3	1	3	3	3	1	1	1	1	1	1
T7	1	1	1	3	3	1		3	2	3	2	3	3	3	3	1	1	1	1	1
T8	1	1	1	2	1	2	2		1	3	2	2	1	3	2	1	1	1	1	1
T9	1	1	1	1	1	1	1	1		3	1	3	1	3	3	1	1	1	1	1
T10	1	1	1	1	3	2	1	2	1		3	3	1	3	3	1	1	1	1	1
T11	1	1	1	1	3	2	1	1	1	3		3	3	3	2	1	1	1	1	1
T12	1	1	1	1	2	1	1	1	2	2	1		3	2	1	1	1	1	1	1
T13	1	1	1	1	1	2	2	1	1	1	1	2		2	1	1	1	1	1	1
T14	1	1	1	3	2	3	3	2	1	3	1	2	1		3	1	1	1	1	1
T15	1	1	1	1	3	1	2	1	2	2	1	2	2	3		1	1	1	1	1
T16	2	1	1	1	1	1	1	1	1	1	1	1	3	1	1		1	1	1	2
T17	3	3	2	2	2	2	2	2	2	3	3	2	2	2	2	2		2	2	3
T18	2	2	1	2	2	2	2	1	1	1	1	2	2	3	1	1	1		3	1
T19	3	2	1	1	2	2	2	3	2	2	2	3	2	2	2	1	2	1		2
T20	3	3	3	2	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	

Figure 21.3. Strength of interactions between the Aichi targets, based on expert opinion, depicted as effect of row on column. Numbers indicate the mode of the strength of the relationship (1 – low, 2 – intermediate, 3 – high). For example, the impact of Target 2 (T2, integration of biodiversity values) on Target 10 (T10, protection of vulnerable ecosystems) is strong, while the impact of T10 on T2 is rather weak.

Several other targets are primary impacted by other targets (Fig. 21.3). For example, targets 12 (Species Conservation), 13 (Genetic Diversity), 10 (Vulnerable Ecosystems) and 15 (Ecosystem Restoration and Resilience) are heavily affected by actions taken in other targets, so they benefit most from progress towards all other targets, albeit indirectly. Nevertheless, implementing actions that are directly related to a particular target (e.g., implementing policies to maintain genetic diversity of livestock, or preventing

further extinctions of species) are the first, urgent steps to making progress towards these targets and are amongst the actions which will produce faster positive effects on biodiversity

In fact, is also important to acknowledge and understand the time lags between actions taken and outcomes achieved. Even with full implementation of the Aichi Targets, there are incompressible time lags that make improvements in the status of biodiversity lag behind the implementation of measures of protection of biodiversity and ecosystems, or reduction in pressures.

Achieving the targets of Strategic Goal C is projected to have the most immediate effects on the status of biodiversity since these targets directly aim at safeguarding ecosystems, species and genetic diversity. For example, conservation actions directed at species on the brink of extinction can have immediate effects in improving the species status. Still, lags between conservation actions such as the establishment of protected areas and the improvement of biodiversity status are likely to occur due to long-term ecosystem and species population dynamics. Moreover, without broader efforts to reduce pressures on biodiversity and ecosystems (e.g., climate change and pollution), these measures can only be partially and temporarily successful in halting the loss of biodiversity. The aim of Strategic Goal B is to start reducing these direct pressures on biodiversity and ecosystems. However, broad scale reduction in many pressures is projected to take years or even decades due to time lags in socio-economic systems and in the biological and physical dynamics of the Earth system. The aims of Strategic Goal A are to initiate the groundwork necessary for the socio-economic transitions that are required to reduce direct pressures on biodiversity. The Targets within Strategic Goal A are essential for attaining long-term sustainability, but they are likely to be associated with long time lags, and to some extent, they are also the most challenging from the point of view of societal changes.

Recognizing the inherent time lags described above, Strategic Goal D aims to ensure that, in the meantime, the most essential ecosystem services are, as far as possible, not compromised. Goal D also promotes ecosystem restoration that can be initiated quickly, and have short-term positive effects on biodiversity and ecosystem services, but can take several decades to reach full benefits. Goal E contains enabling actions that can be implemented quickly to support the other Goals.

These time lags should be kept in mind when considering the trends and extrapolations summarized in the previous section of this report. In general, indicators suggest that responses are showing positive trends, while many pressures are increasing and status is declining. This is in part due to the time lags mentioned above, although this may also be attributed to insufficient responses in many cases.

(3) CONTRIBUTION TO THE MILLENNIUM GOALS AND THE POST-2015 DEVELOPMENT AGENDA

This Outlook is published at an opportune time to consider the critical links between biodiversity and long-term goals for human development.

Contribution to the achievement of the Millennium Development Goals

The Millennium Development Goals (MDGs) came into being in September 2000. They prioritize basic needs in global efforts to reduce poverty. Hence, MDG1 focuses on poverty and hunger, MDGs 2 and 3 focus on education and empowerment, MDGs 4-6 focus on health, whilst MDG7 (environmental sustainability) and MDG8 (global partnership for development) provide something of the enabling environment.

The relationship between biodiversity and poverty goes both ways; biodiversity provides important opportunities for poverty reduction and economic development, while loss of biodiversity and natural

resources will exacerbate current risks. For example, actions to conserve biodiversity can positively contribute to MDGs 1 and 6:

MDG1 – Eradicate Extreme Poverty and Hunger. Poor people, especially rural communities, rely more directly on biodiversity than others because of their limited ability to purchase alternatives. In many regions people are dependent on food, water and energy derived directly from natural areas such as forests and coral reefs. Biodiversity can act as a safety net for the poor in times of crisis, and it may provide a route out of poverty in some circumstances. In the short term it is the availability of natural resources that is most beneficial to the poor, although diversity, including for example different crop varieties, is important from a risk management perspective and for sustaining benefits by ensuring resilience to shocks and longer term change.

MDG6 – Combat HIV/AIDS, malaria and other diseases. Biodiversity is a source of traditional medicines relied upon by a great majority of people in developing countries, In addition, although natural ecosystems, particularly in the tropics, often support pathogens and disease vectors, there is increasing evidence that ecosystem degradation and fragmentation is linked with increased risk for disease transmission. Biodiversity can also contribute to addressing the increasing global burden of non-communicable diseases, through its contribution to nutrition and commensal human microbiotas.

The importance of biodiversity for development is recognized by the MDGs under goal 7 (ensure environmental sustainability) that includes the CBD 2010 biodiversity target to 'reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss'. However, in the implementation of the MDGs, and in particular through the creation of a distinct, 'separate' goal for environmental issues, the importance of biodiversity for the achievement of the other MDGs (including the high-profile goals on poverty, food, and health) has not been sufficiently recognized and promoted.

Integration of biodiversity in the post-2015 development agenda

GBO4 was compiled as discussions continued on the scope of a suite of Sustainable Development Goals (SDGs) to be implemented from 2015 to follow the Millennium Development Goals (MDGs). Among the key messages from the analysis for GBO4 on this issue are:

- Biodiversity and ecosystem services can contribute to economic growth and poverty reduction. Equally, biodiversity loss has negative consequences for society, and action to reduce pressures on biodiversity can support a broad range of societal benefits.
- Meeting the Aichi Biodiversity Targets would help achieve goals for other global development priorities including poverty, hunger, health and a sustainable supply of clean energy, food and water.
- The direct contribution of the environment Millennium Development Goal (MDG7) to achieving the other goals was not sufficiently clear, possibly diverting attention and action away from biodiversity issues.
- The current sustainable development agenda provides an opportunity to bring biodiversity into the mainstream of the broader development agenda.

Some ways that biodiversity could be integrated into post-2015 development agenda include:

- The development and use of comprehensive indicators of progress towards sustainable development that incorporate biodiversity values (for example, as part of "natural capital");
- The integration of biodiversity into goals relating to food security and nutrition, water, and health, and other relevant goals, though the use of relevant targets and indicators;
- A sustainable development goal focused on the conservation and sustainable use of biodiversity and the restoration of ecosystems, including oceans; and

- Inclusion in the SDG framework, of the enabling conditions for the conservation and sustainable use of biodiversity, addressing the underlying drivers of biodiversity loss.

The Strategic Plan for Biodiversity 2011-2020, its Aichi Biodiversity Targets and Vision for 2050 provides elements that could be drawn upon in developing the post-2015 development agenda and sustainable development goals.

The relationships between biodiversity and development and between biodiversity and poverty reduction are not simple, and mutually beneficial outcomes are by no means assured. While some trade-offs are inevitable, measures to conserve biodiversity and reduce poverty can be complementary as is demonstrated in the next section.

(4) ACHIEVEMENT OF THE 2050 VISION FOR BIODIVERSITY

The role of biodiversity in supporting human well-being is recognized in broad terms in vision of the Strategic Plan for Biodiversity 2011-2020 which is: "*Living in Harmony with Nature*" where "*By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people*".

To help analyse the longer-term dependencies between action related to biodiversity and broader challenges facing human societies, GBO-4 looked at trends based on "business as usual" as well as plausible scenarios for simultaneously meeting biodiversity, climate and poverty reduction objectives, consistent with the 2050 Vision.

Challenges of business as usual scenarios

Future scenarios explored in previous chapters suggest five major challenges for the period to 2050. With business as usual, the following challenges will arise which must be addressed if the Vision of the Strategic Plan is to be attained:

- *Climate change is projected to become a major driver of biodiversity and ecosystem change by 2050.* Global temperature increases of 0.4 to 2.6°C by 2055 and 0.3 to 4.8 °C by 2090 will be accompanied by rising sea levels, changes in precipitation patterns, substantial loss of summer Arctic sea ice and increasing ocean acidification. These changes will have a broad range of impacts on biodiversity at genetic, species and ecosystem levels including shifts in the distribution of species and ecosystems, changes in species abundance and increased risk of extinctions. Efforts to mitigate climate change could also have very large impacts, both positive and negative, on biodiversity.

- *Demand for fertile land is projected to substantially increase by 2050*. The combination of expanded agriculture and bioenergy could results in a global land squeeze in which there is not sufficient room to conserve natural terrestrial habitats, leading to large declines in biodiversity.

- *Many Wild fisheries are likely to collapse and aquaculture is foreseen to dominate fish production by 2050.* If harmful subsidies are not reduced and management of territorial and non-territorial marine systems do not improve, negative impacts of wild-capture marine fisheries are projected to substantially increase by 2050 in many regions, including the collapse of exploited fish populations. Thus the large increases in global fish production foreseen for 2050 are projected to come primarily from aquaculture This rapid expansion raises a variety of concerns including pollution, increased demand for high protein feed and competition for land or coastal areas.

- *Water scarcity is foreseen to increase in many regions of the globe by 2050.* Global water withdrawals from freshwater systems are projected to nearly double by 2050 in most business as usual scenarios. This would result in reduced water flow for freshwater ecosystems, which are highly dependent on water flow to maintain biodiversity and ecosystem functions. Water for food production currently accounts for 84% of global water consumption and dominates projected future global water consumption.

- *Combinations of drivers could push some systems beyond tipping points at regional scales by 2050.* There is evidence that several large-scale regime shifts have already started and scenarios suggest that these could cause substantial disruption of social-ecological systems The two most well understood examples are degradation of coral reefs due to combinations of pollution, destructive fishing, invasive alien species, ocean acidification and global warming, and loss of summer Arctic sea ice due to global warming. More speculative regime shifts include degradation of the Amazonian tropical humid forest due to combinations of deforestation, use of fire and global warming, and collapse of some tropical fisheries due to combinations of overfishing, pollution, sea level rise and global warming. These relatively rapid and large shifts in ecosystem structure and function at regional scale are projected to have large negative impacts on biodiversity, ecosystem services and human well-being if not averted.

Alternative pathways to the 2050 Vision

Scenarios for 2050 indicate that very substantial changes from business-as-usual trends are needed in order to meet three key global objectives: slow and then stop the loss of biodiversity, keep global warming below 2°C and attain other human development goals. As many examples of recent environmental successes illustrate, solutions for a sustainable future will require a wide range of deep societal transformations – there is no silver bullet.

Global scenarios developed in the context of the "Rio+20" United Nations Conference on Sustainable Development are used throughout the Global Biodiversity Outlook 4 to illustrate the diversity, complexity and feasibility of pathways to a sustainable future. These major transformations in development pathways will need to be fully engaged over the current decade in order to meet these objectives because of the long lag times inherent in social and technical transitions and in the biological, climate and oceans systems of the Earth.

- *Climate change and energy systems* - Halting deforestation and appropriately implementing reforestation can make important contributions to climate mitigation and protection of biodiversity. Major reductions in greenhouse gas emissions and improved energy efficiency are required to keep global warming below 2°C while also reaching human development goals. Biodiversity objectives can only be attained if massive deployment of biofuels is avoided. A substantial degree of climate change by 2050 and beyond is already committed due to long lags in the Earth's climate system, so adaptation plans for biodiversity are needed. For example, adaptation will require anticipating climate change in the design of protected area systems.

- *Food systems* – Major transformation of food systems is one of the most important keys to achieving sustainability. First, food waste needs to be reduced (roughly a third of harvested food is lost either in the food transport and transformation chain (primarily in developing countries) or in the home (primarily in developed countries)). Second, diverse diets combined with global convergence to moderate levels of calorie and meat consumption would improve health and food security in many areas and also substantially reduce impacts on biodiversity. Third, there is a need for improved management of agriculture, aquaculture and wild-capture fisheries. Realistic changes in management of crops and livestock could substantially reduce both water consumption

and pollution. Significant reductions in fishing pressure and changes in fishing techniques in most marine fisheries would lead to rebuilding of fisheries over the next one to two decades.

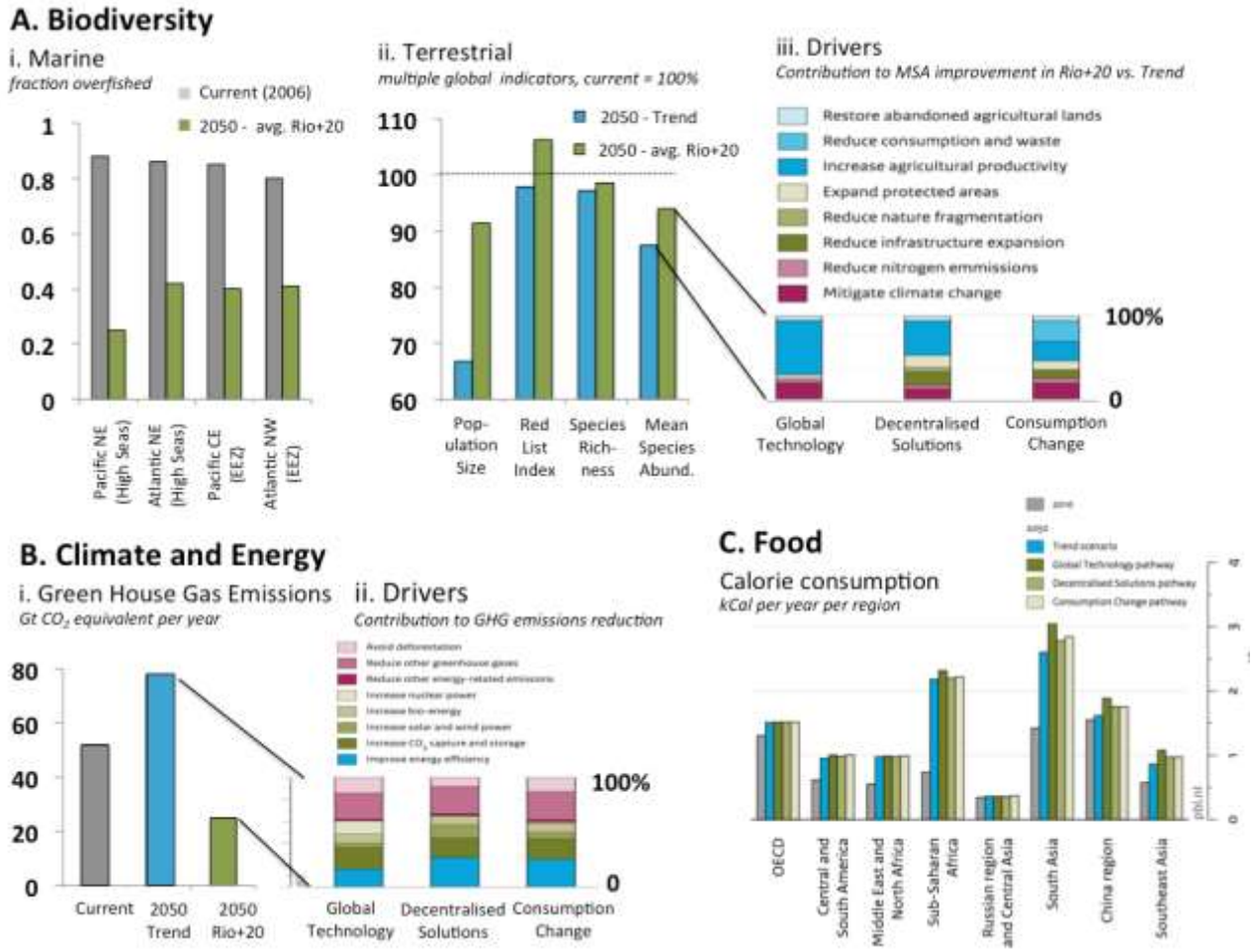


Figure 21.4. Multiple indicators of response to actions taken in the Rio+20 socio-economic scenarios. This scenarios based, on contrasting pathways, would each reach by 2050 the goals of slowing and eventually halting biodiversity loss by 2050, keeping global temperature increases within two degrees Celsius, and achieving a range of socio-economic development goals including ending hunger, and providing universal access to safe drinking water, basic sanitation and modern energy sources. The three scenarios are: "*Global Technology*" scenario meets these combined goals by focusing on large-scale technological solutions, such as intensive agriculture and a high level of international coordination; "*Decentralized Solutions*" interweaves agriculture with natural corridors and national policies that regulate access to food; and "*Consumption change*" concentrates on limiting demand for food by limiting meat intake per person, and by ambitious efforts to reduce waste in the food system.

A) ***Biodiversity indicators for i) marine and ii) terrestrial ecosystems***. A.i) Fraction of fish stocks overfished in the four regions of the oceans current (grey) and for an average of the three Rio+20 scenarios (green, see below and chapter 6 for details). These four regions currently have the highest fraction of stocks overfished of all global regions. A.ii) Four indicators of terrestrial species response to socio-economic scenarios following the Trend scenario for 2050 (blue) or Rio+20 for 2050 (green). Population size and Red list status are for carnivores and ungulates; species richness and mean species abundance (MSA) are for a wide range of species groups. MSA measures the degree to which species abundances differ from a "natural" reference ecosystem (see chapter 12 for details). A.iii) Drivers of MSA differences between the Trend and Rio+20 scenarios (from PBL 2012).

B) ***B Climate and energy.*** B.i) Green house gas emissions: current (grey), Trend scenario for 2050 (blue) and Rio+20 scenario (green) (adapted from PBL 2012). B.ii) Drivers underlying differences between Trend and Rio+20 scenarios.

C) ***C. Food****. C*) Regional calorie consumption: current (grey), Trend scenario for 2050 (blue) and Rio+20 scenario (green) (from PBL 2012). All Rio+20 scenarios achieve eradication of hunger by 2050 as set in the Millennium Development Goal 1.

Figure 21.4 illustrates several facets of achieving the 2050 vision in the Rio+20 pathways:

- rebuilding marine fisheries due to reduced fishing pressure.
- Improved terrestrial biodiversity status compared with business-as-usual (Trend) scenarios

Scenarios suggest that these biodiversity goals can be attained while also reaching broader socio-economic objectives that include strong climate mitigation, improved diets and the eradication of hunger

The analysis emphasizes the crucial importance of major changes in our systems of food production, distribution and consumption, as well as in energy use, if we are to reach a more balanced and sustainable relationship between human aspirations and the capacity of the planet to provide them.

(5) CONCLUSIONS

This Outlook provides a timely reminder that 'business as usual' in our present patterns of behaviour, consumption, production and economic incentives will not get us to the vision of a world with ecosystems capable of meeting human needs into the future.

Since the agreement of the Strategic Plan on Biodiversity in 2010, encouraging steps have been taken around the world to tackle biodiversity loss at many levels. Nevertheless, it is clear from this mid-term review that they have not been sufficient to meet most of the Aichi Biodiversity Targets by their required deadline.

The Strategic Plan and its Targets remain a solid framework on which to concentrate action that will lead us towards that vision. They also point the way towards many actions that will meet multiple needs of human societies including the aspirations currently being discussed in the context of the Sustainable Development Goals.

The following general conclusions can be drawn from the assessment carried out for this Outlook:

- Meeting the Aichi Biodiversity Targets would contribute significantly to broader global priorities addressed by current discussions on post-2015 sustainable development goals; namely, reducing hunger and poverty, improving human health, ensuring a sustainable supply of energy, food and clean water, contributing to climate-change mitigation and adaptation, combating desertification and land degradation, and reducing vulnerability to disasters;

- Actions to achieve the various Aichi Biodiversity Targets should be undertaken in a coherent and coordinated manner; the individual Aichi Biodiversity Targets should not be addressed in isolation. Actions towards certain targets, notably those that address the underlying causes of biodiversity loss, the development and implementation of national biodiversity strategies and action plans, the further development and sharing of information, and the mobilization of financial resources, will have an especially strong influence on the achievement of the other targets;

- Attaining most of the Aichi Biodiversity Targets will require implementation of a package of actions, typically including: legal or policy frameworks; socioeconomic incentives aligned to such frameworks; public and stakeholder engagement; monitoring; and enforcement. Coherence of policies across sectors and the corresponding government ministries, is necessary to deliver an effective package of actions;

- It will be necessary to broaden political and general support for the Strategic Plan for Biodiversity 2011-2020 and the objectives of the Convention. This will require working to ensure that all

levels of government and stakeholders across society are aware of the multiple values of biodiversity and related ecosystem services;

- Partnerships at all levels are required for effective implementation of the Strategic Plan for Biodiversity 2011-2020, to leverage broad-scale actions, to garner the ownership necessary to ensure the mainstreaming of biodiversity across sectors of government, society and the economy and to enable synergies in the national implementation of the various multilateral environmental agreements;
- There are opportunities to support implementation of the Strategic Plan through enhanced technical and scientific cooperation among Parties. Further capacity-building support will also be needed, especially for developing countries, in particular the least developed countries and small island developing States, as well as countries with economies in transition; and
- An overall substantial increase in total biodiversity related funding, is needed for the implementation of the Strategic Plan for Biodiversity 2011–2020.

The priority actions set out in GBO4 can form the basis of a challenging but achievable roadmap for the remainder of the UN Decade of Biodiversity. If governments seize this opportunity and unite once again around a common agenda as they did in 2010, the vision set out in Nagoya is still within our reach.

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