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#### THE USE OF INDICATORS TO ASSESS PROGRESS TOWARDS THE ATTAINMENT OF THE AICHI BIODIVERSITY TARGETS IN THE FIFTH NATIONAL REPORTS TO THE CONVENTION ON BIOLOGICAL DIVERSIFY

*Note by the Executive Secretary* 

#### I. INTRODUCTION

1. In paragraph 20 (b) of decision XII/1, the Conference of the Parties to the Convention on Biological Diversity (CBD) requested the Executive Secretary to convene a meeting of the Ad Hoc Technical Expert Group (AHTEG) on Indicators for the Strategic Plan for Biodiversity 2011-2020. In the terms of reference for the meeting, the Conference of the Parties requested the AHTEG to consider, among other things, the use of indicators to monitoring progress in the implementation the Strategic Plan for Biodiversity 2011-2020 in the fifth national reports.

2. This document looks at the use of indicators in 131 fifth national reports to the Convention on Biological Diversity. The second section of the document provides general observations on indicator use in the fifth national reports, while the third section provides specific information related to each of the Aichi Biodiversity Targets and examples of the ways Parties have made use of indicators. The final section of the report compares the gaps in the global indicator use in this document are intended to be illustrative of the type of indicators used by Parties in their national reports rather than an exhaustive list. The names of the indicators mentioned in this document may differ slightly from those in the national reports as the names have been shortened or generalize to reduce the overall length of the text.

#### II. GENERAL OBSERVATIONS

3. While most Parties make use of at least a few indicators in their national reports, how they are used is highly variable. The indicators in the national reports tend to be a mixture of both outcome or impact indicators (those that measure a change in the status of biodiversity) and process indicators (those that measure a change in the status of biodiversity) and process indicators (those that measure actions taken). Some reports have referred to and made use of comprehensive sets of indicators, however most have used them in a less systematic way. However even those reports that have made extensive use of indicators, often have gaps where certain targets or elements of targets do not have indicators. Given this, almost all of the assessments of progress towards the Aichi Biodiversity Targets in the fifth national reports made use of various sources of information in addition to indicators to arrive at their conclusions. This includes such things as literature reviews of government reports, scientific articles and grey literature, as well as expert opinion and stakeholder consultations.

4. In many reports the same indicator was used multiple times, but with different interpretations or disaggregations to assess progress towards several targets. For example indicators related to protected

areas were used to assess progress towards both targets 5 and 11. Similarly indicators used for target 8 were often disaggregated to look at specific chemicals or pollutant inputs to different environments.

5. Many of the indicators used in the fifth national reports are not necessarily specific to biodiversity or solely related to monitoring the implementation of the Strategic Plan. For example many reports contain information related to changes in forest cover or fish stocks which are relevant to other sectors and may have in fact been developed for purposes other than biodiversity monitoring.

6. The use of indicators is also not consistent across the Aichi Biodiversity Targets. Indicators are most often used for targets 5, 11, 12 while relatively few Parties have used indicators to assess progress towards targets 2, 3, 13, 16, 17, 18 and 19.

7. The indicators used by Parties to assess progress towards the Aichi Biodiversity Target are often similar. For example many parties have indicators related to habitat loss, species extinction or protected areas. These indicators may have different names but often measure similar things. Similarly many Parties have used similar indicators but have focused on different geographic levels such as ecosystems, region, state/province or subnational levels. However differences in methodologies, baselines and definitions make drawing comparisons between countries or aggregating national information difficult if not impossible.

8. While some of the indicators used in the fifth national reports are noted in the annex to decision XI/3 (Indicative list of indicators for the strategic plan for biodiversity 2011-2020) many are not. In most cases the reports make use of indicators which are nationally specific. Some countries have developed their own national indexes to monitor changes on certain subjects. Further, many of the reports make use of indicators related to regional processes. This is particularly the case for those countries part of the European Union.

9. In the national reports there are many instances where information is included that implies the existence of an indicator (for example when a description of change is given for a certain time period) but the indicator itself is not acknowledged. Similarly there is information in the national reports which would appear to lend it to be turned into an indicator but it is not necessarily presented as such.

10. Many of the national reports refer to proposed indicators or processes to develop indicators in the future. This is most often raised in relation to the implementation and monitoring of updated national biodiversity strategies and action plans. However, from the information in the national reports, it is rarely clear what is being done to develop these indicators or what processes were in place to collect the necessary data to make them usable.

11. Many of the indicators used in the national reports had data for several time periods allowing for the development of a trend line. The most common types of indicators with multiple data points tended to be related to biophysical factors (such as the area of a given habitat type), indicators related to resource extraction (such as the areas deforested) and to government processes (such as amounts of funding for specific programmes, the number of actions taken). However the indicators used in the national reports tended to have time lags. Few reports contained indicators with information from 2013 or 2014 and several reports noted that this was an issue. In addition, only in a few cases were any sources of uncertainty associated with the indicators acknowledged.

12. Approximately 40 per cent of Parties included an explicit assessment of progress towards each of the Aichi Biodiversity Targets. These assessments generally rated progress towards each Aichi Biodiversity Target using a rating system with different categories to describe progress. The types of categories used by Parties varied but they were generally on a spectrum ranging from little or no progress to the target likely to be achieved. The methodologies used to arrive at these assessments was not generally clear from the national reports however it is clear that, in most cases, they drew on multiple sources of information, including expert opinion.

#### III. ASSESSMENT OF INDICATOR USE PER TARGET

**Target 1** - 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

13. A number of biodiversity indicators have been used by Parties to assess progress towards this target. These can generally be grouped into two categories. Those that directly assess people's awareness of biodiversity and those which provide information on the number of relevant activities carried out or people's participation in certain events.

14. The most common indicator used for directly assessing people's awareness of biodiversity was surveys. These surveys tended to ask respondents question to determine how familiar they were with biodiversity, their perceptions of its status or importance or their degree of agreement with various statements. In some cases the surveys referred to in the national reports looked at issues related to the environment generally rather than to biodiversity specifically. Further, based on the information in the national reports it would appear that different types of survey methodologies were used and that the number and type of people responding varied as well.

15. The second category of indicators in the reports captured information related to participation in events, the number of communication and awareness raising actions taken, or the extent to which biodiversity was integrated into educational curriculum. In some cases these indicators looked at government activities but some also looked at issues associated with other segments of society, such as membership in certain NGOs. Examples of the types of indicators used in the national reports are:

(a) The number of municipalities participating in municipal biodiversity networks (Japan);

(b) The percentage of people who agree that conservation is important (New Zealand);

(c) Trends in the number of (passive) members of nature management organizations (Netherlands);

(d) The percentage of people who report that they take definite action to protect the environment (Canada);

(e) Index of volunteer time spent in selected conservation organizations (United Kingdom (see figure 1.1));

(f) Familiarity with the term biodiversity (Hungary, Malta, Switzerland, Thailand (see figure 1.2));

(g) Participation in volunteer-based bird surveys (Canada).

**Figure1.1**. United Kingdom - Total volunteer hours recorded by the Botanical Society for Britain and Ireland and Plantlife from 2007-2012.



**Figure 1.2.** Thailand - Percentage of survey respondents that had understanding the term "biodiversity". The survey categories responses as being correct, mostly correct, some understanding or insufficient understanding. The results of the survey were also disaggregated by gender.



Target 2 - 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.

16. Very few reports made use of indicators to assess progress towards this target. Many countries refer to different valuation studies associated with specific ecosystem services or habitats but these largely appear to be one of studies as opposed to indicators. One example of an indicator used to assess progress towards this target was the number of environmental impact assessments carried out per year (Malta).

Target 3 - 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 socioeconomic conditions.

17. There are few if any indicators used in the fifth national reports to assess progress towards this target. Progress is generally assessed through other means including case studies, expert opinion and examples of the types of actions taken. One example which is counter to this general trend is Mexico which has an indicator related to the changes in the area with payment for ecological service schemes.

Target 4 - 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.

18. The indicators used by Parties in their national reports to assess progress towards this target tended to focus on issues associated with consumption rather than production. Some of the indicators used focused on specific resources, such as water, while others looked at consumption more generally. The most commonly used indicator was the ecological footprint. In comparison with other targets relatively few national reports contained indicators relevant to this target. Examples of the types of indicators used in the national reports are:

(a) The ecological footprint (European Union, Iraq (see figure 4.1), Lichtenstein, Switzerland)

(b) Trends in green public procurement (Poland)

(c) The quantity of fish needed to supply 20kg and 35kg of fish per person per year (Vanuatu)

(d) Water consumption by sector (Monaco)

(e) The number of organizations participating in business and biodiversity initiatives (Japan(see figure 4.2)





**Figure 4.2.** Japan – Number of municipalities participating in municipal biodiversity networks between 2011 and 2013 (left) and the number of organizations participating in the Japan Business and Biodiversity Partnership (right) between 2010 and 2013



Target 5 – By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced

19. The most prevalent indicators used in the national reports to assess progress towards this target relate to changes in the areal extent of certain ecosystems, most commonly forests. Further the indicators tend to be primarily terrestrial in nature with few indicators for inland waters or the marine environment. Further in some cases the indicators that are used are highly specific and focus on certain key habitats of national importance. In almost all cases the reports do not contain information on all habitat types that are in a country.

20. Many national reports also contain information which implies to existence of indicators but do not actually refer to them. For example a number of reports refer to changes in habitat area between two periods of time. This implies that an indicator has been used to arrive at this observation but the indicator itself may not be referred to.

21. In addition to those indicators that refer to the extent of habitat, some reports contain information on habitat quality or status, however these are relatively few. Similarly only a few reports use indicators related to land degradation and fragmentation.

22. Some reports contain indicators related to the magnitude of certain pressures, such as fire or pollution, on certain types of habitats. These types of indicators are also relevant to those targets which fall under Strategic Goal B. Several of the national reports also refer to actions taken to conserve habitats. These include such activities as the creation of protected areas or restoration and are therefore also relevant to Target 11 and 15.

23. Overall the types and number of indicators used to assess progress towards this target in the national reports is generally greater than those for other Aichi Biodiversity Target. However as noted above, there remain gaps. Examples of the types of indicators used in the national reports are:

(a) Ecosystem threat status/conservation status (Belgium, Hungary, Malta, Poland, South Africa, Romania, United Kingdom);

- (b) Net changes in areas of terrestrial ecosystems (Brazil, China);
- (c) Land-use change (Mexico);
- (d) Extent of Arctic Summer sea ice (Canada);
- (e) Percentage of wetlands/tidal flats restored (Japan);

(f) Change in forest cover (Belarus, Cambodia, China (see figure 5.1), Colombia, Costa Rica, Denmark, Ecuador, Myanmar, Philippines, Uganda, Senegal, Sudan Seychelles, Thailand);

- (g) Average afforestation area (Canada, Poland, Sudan (see figure 5.2));
- (h) Deforestation rates (Brazil, Canada);
- (i) Coral coverage (Seychelles);
- (j) Change in mangrove cover (Costa Rica, India, Fiji, Myanmar, Mozambique, Senegal);
- (k) Landscape quality (Germany);
- (l) Landscape fragmentation (Switzerland, Luxemburg);
- (m) Threats to key biodiversity areas (Iraq);
- (n) Native/natural land cover change (Guinea-Bissau, New Zealand);
- (o) Change in land use (Azerbaijan, Hungary);
- (p) Forest fire/burned areas (Azerbaijan, Brazil, Canada, Botswana, Mozambique, Mexico);
- (q) Accessibility of waters and rivers for migratory fish species (Netherlands);
- (r) Forest species composition (Czech Republic, Denmark);
- (s) Forest degradation (Malawi);

(t) Change in habitat connectivity for selected broad habitats in the wider countryside (United Kingdom);

**Figure 5.1.** China – Net change in the area of terrestrial ecosystems in square kilometres in China between 2000 and 2010



Figure 5.2. Sudan – Average rate of aforestation and deforestation between 1990 and 2011



Target 6 - 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.

24. The most common type of indicator used to assess progress towards this target related to the size of fish catches/landing. Some Parties used indicators that reported on fish catches generally while others used indicators which looked at specific species, such as tuna. These types of indicators generally address issues related to the first part of the target, namely that fish stocks are managed and harvested sustainably. There were relatively few reports which contained indicators related to the other elements of the targets. Examples of the types of indicators used in the national reports are:

(a) Fish catch/landing estimates/production (Brazil (see figure 6.1), Cote D'Ivoire, Iraq, Kiribati, Malawi, Mali, Netherlands, Niue, Pakistan, Samoa, Thailand, Uganda);

(b) Number of major stocks harvested relative to approved levels (Canada (see figure 6.2));

(c) Percentage of fish stocks harvested sustainably and at full reproductive capacity (United Kingdom);

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- (d) Marine trophic index (China, Cote D'Ivoire);
- (e) Fish risk status (Indonesia, Mongolia);
- (f) Spawning biomass (Denmark);
- (g) Fishing capacity (Thailand);
- (h) Fishing effort (Thailand);
- (i) Fish consumption (Kiribati, Netherlands, Vanuatu);
- (j) Quantity and value of fish production, by type of fishing operation (Philippines).

Figure 6.1. Brazil – Total national fisheries production (tons) by Brazilian states between 2010 and 2011



**Figure 6.2.** Canada – Number of major stocks harvested relative to approved levels between 2011 and 2012.



## Target 7- By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity

25. Parties have used a variety of indicators in their national reports to assess progress towards this target. The indicators used have tended to focus on issues related to agriculture and forestry. By comparison there were relatively few indicators related to aquaculture. While a number of parties used

indicators related to certified forestry and aquaculture or the size of farmland using organic agriculture, few indicators addressed sustainable management directly. Examples of the types of indicators used in the national reports are:

- (a) Ratio of production on water surfaces subject to aquaculture improvement plans (Japan);
- (b) Changes in status of community forestry (Comoros, Nepal (see figure 7.1));
- (c) Land assisted under agro-environmental measures (Germany, United Kingdom);
- (d) Livestock estimates 2006-2009 (Iraq);

(e) Change in area under organic production (Costa Rica, Denmark, Hungary, Netherlands, Poland):

(f) Change in certified forest territory (Brazil, Netherlands, Spain, Switzerland, United Kingdom);

- (g) Log export per year (Solomon Islands);
- (h) Influence of field margins on pest insects (Netherlands);
- (i) Forest regeneration on provincial crown lands (Canada);
- (j) Forest restoration (Philippines);

(k) Trends in total volumes of capture fisheries and aquaculture (Uganda (See figure 7.2),

Tunisia);

(1) Farms with an environmental farm plan (Canada).

Figure 7.1. Nepal – Changes in status of community forestry between 2008

Categories	2008	2013 (June)	% Change (2008-2013)
User Groups	14,431	18,133	25.7
Households	1,660,000	2,237,195	34.8
Forest Area (ha.)	1,230,000	1,700,048	38.2

**Figure 7.2.** Uganda – Trends in total volumes of capture fisheries and aquaculture between 1997 and 2009



Target 8 - By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity

26. The most commonly used indicators in the fifth national reports to assess progress towards this target are those related to nitrogen and phosphorus concentrations. However Parties have used a variety of indicators related to these nutrients. Some reports use indicators related to their concentrations in the environments, others have used indicators related to the levels of nutrients leaving terrestrial systems, or to the number of areas which exceed critical thresholds. Further, a number of Parties used indicators that relate to specific ecosystems, such as specific freshwater bodies, or indicators which relate to certain phenomena associated with nutrients, such as eutrophication or acidification. Generally the national reports contain fewer indicators related to pollution other than to nitrogen or phosphorus.

27. Some Parties have used indicators in their national reports which are relatively broad, such as the import or use of fertilizers, pesticides and insecticides, the amount of untreated water waster or the amount of waste material generated. However, while these indicators are highly relevant to this target, they do not necessarily indicate if levels of nutrients or other pollutants are at or above levels which are detrimental to biodiversity. Examples of the types of indicators used in the national reports are:

- (a) Areas that exceed critical loads of nitrogen (Belgium, Denmark, Germany);
- (b) Water quality in rivers, lakes/marshes, and marine areas (Japan);
- (c) Inflow load of nitrogen and phosphorous from terrestrial areas (Japan);
- (d) Fertilizer and insecticide imports in (Niue);
- (e) Agricultural chemicals use (Brazil, China);
- (f) Fertilizer, pesticides and herbicides consumption (Egypt, Iraq);
- (g) Discharge of untreated waste water (Azerbaijan (see figure 8.1);
- (h) Rate of municipal wastewater treatment (China);
- (i) Annual volume of hazardous wastes (Azerbaijan);
- (j) Nitrogen and phosphorus concentrations in watercourses (Denmark);

(k) Nature areas that exceed critical loads for eutrophication and acidification (Belgium (See figure 8.2), United Kingdom);

(1) Discharge of nitrogen and phosphorus to marine waters (Denmark);

(m) Temporal variation in mercury found in European flounder caught in the Great Belt (Denmark);

- (n) Temporal variation in organic contaminants in the blue mussel (Denmark);
- (o) Changes in mean soil nutrient values (Switzerland);
- (p) Biochemical oxygen demand (Philippines);
- (q) Nitrate levels in groundwater (Malta);
- (r) Contaminant trends in seabirds (Canada);
- (s) Plastics ingested by seabirds (Canada);
- (t) Nitrogen use (Luxemburg);
- (u) Changes in the amount of pollutant emissions per unit of GDP (China);

(v)  $\;$  Percent of population with access to water supply systems and wastewater collection networks (Brazil);

(w) Combined input of hazardous substances to the marine environment (United Kingdom).



Figure 8.1. Azerbaijan – Discharge of untreated waste water (in million meters cubed) between 2000-2012

**Figure 8.2.** Belgium – Nature areas in Flanders which exceed critical eutrophication loads between 1990 and 2010



Target 9 - 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.

28. The mostly commonly used indicators to assess progress towards this target were those related to the number of invasive alien species in a country. Other types of indicators used provided information on issues associated with the impact of invasive alien species and the areas they affect. Some reports also contained indicators related to the population trends of specific invasive alien species or on the effect of invasive alien species on other species. There were few indicators related to the management of pathways or control and eradication efforts. Examples of the types of indicators used in the national reports are:

(a) The number of alien animal species (Belgium, China, European Union (see figure 9.1), Japan, Italy, Netherlands, United Kingdom);

(b) Animal and plant pest control expenditures on public conservation land (New Zealand (see figure 9.2));

(c) Area affected by Typha domingensis (Senegal);

(d) Impact of eradication programs on the populations of Antiguan Racer, bird populations on off shore islands and seabirds (Antigua and Barbuda);

- (e) Invasive alien plant species by ecozone (Canada);
- (f) Frequency and varieties of pests intercepted by customs and port authorities (China).

**Figure 9.1.** European Union – Cumulative number of alien species established in terrestrial environments in 11 countries



Figure 9.2. New Zealand – Animal and plant pest control expenditure on public conservation between 2009 and 2013

	2013/12 (\$000)	2012/11 (\$000)	2011/10(\$000)	2010/09 (\$000)
Possum control	10,664	13,811	14,752	15,704
Deer control	1,324	1,206	1,547	1,283
Goat control	6,018	5,873	6,779	5,984
Other terrestrial animal pests	8,689	8,799	7,348	6,956
Aquatic animal pest control	669	1,221	1,303	1,136
Weed control	16,919	18,290	19,087	18,892
Specific pest and disease response	1,473	2,119	1,164	1,014

Target 10 - 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.

29. The indicators in the national reports related to this target focused almost entirely on issues associated with the extant and health of coral reefs. There were few, if any indicators related to the multiple anthropogenic pressures on coral reefs or other ecosystems vulnerable to climate change. Examples of the types of indicators used in the national reports are:

(a) Forecast for changes in coral distribution due to global warming and marine acidification under climate change scenario (Japan);

- (b) Trends in live coral cover (Antigua and Barbuda, Costa Rica (see figure 10.1), Malaysia);
- (c) Mean biological oxygen demand and chemical oxygen demand (Sierra Leone);
- (d) Hard coral and macro algal cover (Fiji);
- (e) Variation in reef rugosity (Antigua and Barbuda (see figure 10.2)).

Figure 10.1. Costa Rica – Change in coral cover in Cahuita between 2000 and 2004.



**Figure 10.2.** Antigua and Barbuda – (A) Average percent cover of live coral and (B) macroalgae, (C) density of diadema antilitarum and (D) biomass of parrotfishes and groupers in Antigua and Barbuda.



Target 11 - By 2020, at least 17 per cent of terrestrial and inland water, 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 landscapes and seascapes.

30. In general, the indicators used in the national reports to assess progress towards this target provide information on changes in either the number of protected areas in a country or the overall size of protected areas. Some Parties used indicators which related to forms of protection other than protected areas, such as reserves. By comparison relative few Parties included indicators related to the size of areas particularly important for biodiversity and ecosystem services protected, protected areas connectedness, the integration of protected areas into the wider landscapes and seascapes and the management effectiveness of protected areas. Examples of the types of indicators used in the national reports are:

(a) Changes in the number of protected areas (Bulgaria, China, Egypt, Guinea, Myanmar, Solomon Islands);

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(b) Changes in protected area extent (Brazil, Bulgaria, China, Czech Republic, Egypt (see figure 11.1), European Union, Guinea, India, Germany, Malaysia, Montenegro, Mozambique, New Zealand, Philippines, Poland, Tunisia, United Kingdom);

- (c) Percentage of ecological regions protected (Canada);
- (d) Revenue generated from protected areas (Botswana, Nepal, Philippines);
- (e) Legally protected native land cover (New Zealand);
- (f) Protected inland water bodies (New Zealand);
- (g) Change in reserve areas (Malaysia, Poland, Switzerland);
- (h) Change in protected area condition (Uganda);
- (i) Number of habitats protected under the EU Habitats Directive (Ireland);
- (j) Trend in park visitors (Botswana);
- (k) Number and area of forestry community-conservation areas (China);
- (1) Biodiversity Conservation Index (Brazil (see figure 11.2);

Figure 11.1. Egypt – Increase in the number of protected areas between 1993 and 2012

Number of Protected Areas until 2012



Figure 11.2. Brazil – Biodiversity Conservation Index (ICB) values for Brazilian States



### Target 12 -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

31. Compared to other targets, a large number of indicators were used to assess progress towards this target. However though the indicators used had different names or focuses, they generally addressed issues related to the conservation status or population size of species. In some cases Parties used indicators, such as red list indexes, which looked at the conservation status of groups of different species, while in other cases they used indicators which assessed the conservation status of one or a few specific species of national importance. The indicators used in the national reports tended to focus on terrestrial species and in particular mammals and birds. By comparison there were relatively less indicators related to amphibians, reptiles, invertebrates or aquatic species. Further some indicators provide information on the conservation status of species at specific locations, such as in protected areas or certain key ecosystems, while others related to the whole country. Examples of the types of indicators used in the national reports are:\*

(a) Red list assessments (Albania, Cambodia, China, Denmark, India (see figure 12.1), Mozambique, Netherlands, Samoa, South Africa, Switzerland (see figure 12.2));

- (b) Number of threatened species (Egypt, Japan, Mozambique, Philippines);
- (c) Number of threatened species addressed by action plans (Brazil);
- (d) General status of species (Belgium, Canada);
- (e) Status of species of interest/national importance (Belgium, Czech Republic, India, United Kingdom);
  - (f) Trends in breeding birds (Canada);
  - (g) Subarctic Terrestrial Birds Index (Canada);
  - (h) Changes in number of threatened bird species (Nepal);

<sup>\*</sup> In addition to the indicators listed below many countries included indicators related to the treat status or population size of specific species. These include crested ibis and oriental stork (Japan), flying fox and Pacific pigeon (Niue), tiger (India, Nepal), Bactrian camel, saiga antelope, and Przewalski's horses (Mongolia), elephant (Botswana, India, Uganda), kākāpō (New Zealand), harbour seals (Denmark), giant eland and lion (Senegal), Gorilla (Rwanada), leatherback turtle (Malaysia), common eland, buffalo, Ugandan kob, hippopotamus, white pelican, and gull-billed tern (Uganda), grassland butterflies (European Union), great crested grebe, common pochard, coal tit, water pipit, and black grouse (Czech Republic), and pipistrelle (United Kingdom).

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- (i) Common Birds Index (Belgium, Spain, European Union, Netherlands, Poland);
- (j) Farmland bird index (Denmark, European Union);
- (k) Number of rehabilitation programmes/plans for species in place (Australia, Japan);
- (1) Status of fish (Mongolia);
- (m) Number of evaluated flora (India);
- (n) Number of threatened fish species (Colombia);
- (o) Endangered/endemic species that increase in population (Thailand);
- (p) Number of species on endangered lists (Ecuador, Switzerland);
- (q) Game stock value based (Botswana);
- (r) Change in overall conservation status (Malta);

Figure 12.1. India – Representation of evaluated Indian fauna (n=4681) under IUCN 2013 threat categories



Figure 12.2. Switzerland – Threatened species according to the Red Lists: Extinct, endangered, near threatened and least concern, per group.



Target 13 - 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.

32. The national reports contain few indicators related to this target. Those that are contained in the national reports generally cover issues related to the condition of livestock breeds or to the number of gene bank/seed bank accessions. There are few, if any indicators, in the national reports related to socio-economical or culturally valuable species or issues related to genetic erosion. Examples of the types of indicators used in the national reports are:

- (a) Condition of indigenous livestock/farm animal breeds (Denmark, Spain);
- (b) Number of livestock species with conservation programmes (Poland (see figure 13.1);

(c) Change in mean effective population size for native breeds of sheep and cattle at greatest risk of loss of genetic diversity (United Kingdom);

- (d) Loss of traditional plant varieties (Mali (see figure 13.2));
- (e) Number of registered plant breeds (Switzerland);
- (f) Number of accessions (Czech Republic);
- (g) Family livestock production (Cambodia).

**Figure 13.1.** Poland – Number of animals in cattle breeds covered by programmes for the protection of genetic resources





Figure 13.2. Mali – Loss of traditional varieties in different areas of the country

# Target 14 - 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.

33. Very few, if any, Parties included indicators directly related to this target in their national report. However many reports included indicators that were relevant to a certain extent. These included indicators related to the trends in pollination insects, the designation of key habitats, the restoration of degraded habitats or the conservation of critical habitats. Many of these indicators were relevant to other Aichi Biodiversity Targets.

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

34. The use of indicators to assess progress towards this target in the national reports is limited. The indicators that are used generally fall in to two categories, those related to the area restored and those related to carbons stocks. Examples of the types of indicators used in the national reports are:

(a) Soil carbon stocks (Switzerland (see figure 15.1));

(b) Changes in surface area of raised bogs and fens of national importance within five years (Switzerland);

(c) Trend in the percentage of solved bottlenecks caused by national infrastructure (Netherlands);

(d) Forest restoration/rehabilitation (Czech Republic (See figure 15.2), Indonesia);

(e) Number of forest restoration and desertification control programs implemented (Yemen).

**Figure 15.1.** Switzerland – Changes in carbon stocks through use and changes in soul use (expressed in 1000t CO2eq) between 1990 and 2010. A positive balance means that there are emissions while a negative balance means that the carbon is absorbed by land use, land-use change and forestry (LULUCF)



Restoration method	2000	2002	2004	2010	2011	2012
Man-made restoration	21 867	18 120	19 042	21 859	21 755	19 903
mm-restoration: repeated	4 371	3 212	2 766	3 087	3 712	3 751
Natural	3 422	3 940	4 802	5 127	5 075	5 561
Total	25 309	22 060	23 844	26 986	26 830	25 464

Figure 15.2. Czech Republic – Forest restoration between 2000 and 2012

# Target 16 -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.

35. Very few, if any, Parties used indicators to assess progress towards this target in their national reports. Most Parties assessed progress towards this target by reporting on the steps that had been taken to either ratify the Nagoya Protocol or start making in operational.

# Target 17 - 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.

36. Few Parties used indicators to directly assess progress towards this target. The most common indicators used were those examining the number of completed or initiated activities. Parties developed or used these indicators in different but they tended to consider similar issues. Countries that assessed the status/degree of implementation of actions for their NBSAP include the Czech Republic, Costa Rica, Malta, Mozambique, Niue, Samoa, Spain, and Vanuatu.

Target 18 - 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.

37. Very few Parties assessed progress towards this target with indicators. Those indicators that were used tended to focus on issues related to the traditional use of resources, the maintenance of traditional customs and the participation of indigenous peoples and local communities in certain processes. While these indicators measure issues which are relevant to the target, they do not provide information on progress towards the target specifically. Examples of the types of indicators used in the national reports are:

- (a) Knowledge of Aboriginal Languages (Canada (see figure 18.1);
- (b) Trends in community forestry (Cambodia).



Figure 18.1. Canada – Changes in knowledge of aboriginal languages between 2001 and 2011

# Target 19 -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.

38. The indicators used to assess progress towards this target generally focused on the status of certain processes or activities related to information collection and largely provided information on the improvement of the knowledge and science base related to biodiversity. By comparison, there were few indicators related to the sharing of information, its transfer or its application. Similarly there were few indicators related to the technologies. It is important to note however that many of the indicators related to other Aichi Biodiversity Targets, in the sense they represent an improvement in the understanding of the status and trends of biodiversity, provide a further indication of progress towards this target. Examples of the types of indicators used in the national reports are:

(a) The growth in the number of species records (Cambodia, Ireland (see figure 19.1), Vanuatu);

- (b) The number of peer-reviewed publications from national scientists (Ireland);
- (c) Status of data registration with GBIF (Japan);
- (d) New species discoveries (Philippines(see figure 19.2));
- (e) Biodiversity items searched through Google and Baidu (China).

**Figure 19.1.** Ireland – The number of peer-reviewed publications from Irish scientists in a biodiversity-related discipline since 1990



Figure 19.2. Philippines – New species discoveries by species groups between 2005 and 2012.



Target 20 - 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 resource needs assessments to be developed and reported by Parties

39. The indicators used by Parties in their national report to assess progress towards this target tended to focus on government expenditures in relation to things such as funding from central budgets for environmental issues, trends in funding available for certain ministries or for protected areas as well as expenditures related to official development assistance. Some Parties also used indicators related to the number of employees working in environmental sectors. Few reports, if any, reported on resources spent by the private sector or non-governmental organizations. Further, a number of countries noted that they will be reporting on progress towards this target through the reporting framework for the resource mobilization strategy. Examples of the types of indicators used in the national reports are:

- (a) Trends in funding for different ministries/departments (Nepal);
- (b) Public sector expenditure on biodiversity (United Kingdom);
- (c) Public sector expenditure on international biodiversity (United Kingdom);
- (d) Core funding for biodiversity (India, Mozambique, Malta);

(e) Percentages of the total government workforce employed in government agencies with key environmental responsibilities (Nauru (see figure 20.1));

(f) Funding for protected areas (Ecuador (see figure 20.2));

- (g) Expenditures on official development aid (Norway);
- (h) Investments into biodiversity conservation (China).

**Figure 20.1.** Nauru – The percentages of the total government workforce employed as permanent staff in three government agencies with key environmental responsibilities (the Environmental Office (at DCIE), Lands & Surveys and Quarantine) between 2009 and 2013.







## IV. COMPARISSON BETWEEN AVAILABLE GLOBAL INDICATORS AND NATIONAL INDICATORS

40. Relatively few Parties have used indicators to assess progress towards targets 2, 3, 13, 16, 17, 18 and 19 in their national reports. These targets correspond to those targets that do not currently have an identified global indicator in the indicator framework noted in decision XI/3. However for each of these targets, possible national or other sub-global level indicators have been identified in the indicator framework. In addition, for these targets, indicators which could be used at the global level if they were further developed were also identified in the indicator framework. Therefore while there does appear to be "gaps" in national indicator use, there are possible avenues for addressing these.

41. In addition to the targets mentioned above, there are currently no identified global indicators for Targets 1, 4 and 7 in the indicator framework noted in decision XI/3. However for each of these targets

some Parties have made use of indicators in their national reports. These national indicators provide insight into the types of issues that could be monitored either globally or in order to help address these gaps in the global indicator suite.

42. Through the preparation process for Ad Hoc Technical Expert Group (AHTEG) on Indicators for the Strategic Plan for Biodiversity 2011-2020 additional possible indicators were identified. In total 36 global indicators which are currently ready for use and an additional 34 indicators which could be used globally if they were further developed or used at national level were identified. These indicators could further help to address the gap in indicator use in the national reports.