UNEP

CBD

Convention on Biological Diversity

Distr.
GENERAL

UNEP/CBD/ID/AHTEG/2015/1/INF/9
28 August 2015

ENGLISH ONLY

AD HOC TECHNICAL EXPERT GROUP MEETING
ON INDICATORS FOR THE STRATEGIC PLAN
FOR BIODIVERSITY 2011-2020
Geneva, Switzerland, 14-17 September 2015

# BARRIERS TO THE USE OF GLOBAL INDICATORS AND DATASETS TO SUPPORT NBSAP IMPLEMENTATION AND NATIONAL REPORTING PROCESSES

Note by the Executive Secretary

1. The Executive Secretary is circulating herewith, for the information of participants in the meeting of the Ad Hoc Technical Expert Group on Indicators for the Strategic Plan for Biodiversity 2011-2020, a document examining barriers to the use of global indicators and datasets to support the implementation of national biodiversity strategies and action plans and national reporting processes.

2. The document has been prepared by the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) with the support of the Federal Office for Environment, Government of Switzerland. It is presented in the form and language in which it was received by the Secretariat.

# Information document: Barriers to the use of global indicators and datasets to support NBSAP implementation and national reporting processes.

NOTE FOR REVIEWERS:

This is a working document prepared in support of the Ad Hoc Technical Expert Group Meeting on Indicators. The document authors would like to invite the AHTEG members to provide comments on this document to nadine.bowles-newark@unep-wcmc.org


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## Acknowledgments

UNEP-WCMC would like to gratefully acknowledge the financial support of the Federal Office for the Environment (FOEN), Switzerland.

The authors also wish to express deep gratitude to the project consultative group and expert reviewers for their help and guidance in production of this document:

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## Citation

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## Executive Summary


- A lack of national level biodiversity data can pose serious challenges for countries when developing and implementing a National Biodiversity Strategy and Action Plan (NBSAP), or preparing a National Report.
- Many of the global indicators brought together under the Biodiversity Indicators Partnerships (BIP) are comprised of national level data, or in other cases can be disaggregated at the national level.
- It is important to recognize that global datasets cannot always replace local or national data. However there are global indicators and/or datasets available that can be used to support national indicator development, national reporting, and NBSAP updating and implementation.
- Five key barriers to the use of global indicators and datasets at the national level were identified through a survey of national Convention on Biological Diversity (CBD) Focal Points:
    - Barrier 1: "*Uncertainty regarding the coverage* [and/or] *accuracy of indicators and datasets at the global scale for national or sub-national reporting*".
    - Barrier 2: "*Uncertainty regarding the… applicability of indicators and datasets at the global scale for national or sub-national reporting*".
    - Barrier 3: "*Uncertainty regarding the value added by global indicators and datasets to national or sub-national indicators and datasets*".
    - Barrier 4: "*Availability and accessibility of data taken from global dataset have been deemed too difficult/poor*"
    - Barrier 5: "[Lack of] *technical capacity*"
- Global data sets and associated data may assist countries to bypass some of the limitations that arise from the paucity of data at the national level and thereby provide valuable information to monitor progress and inform conservation policy.
- Political, as well as technical, issues constrain the ability of national level biodiversity practitioners to utilise nationally-derived data. Creating awareness of global datasets can assist in NBSAP implementation and reporting processes.
- Global level indicator developers and data providers can help address these barriers by taking the following steps:
    - Communicating the benefits of using global indicators and datasets through: international organisations, initiatives and networks; materials such as guidance documents, press releases etc.; side events or workshops in the margins of international meetings.
    - Undertaking national level pilot studies to road-test and adapt methodologies to the national level and demonstrate value to national stakeholders.
    - Encouraging lesson sharing between countries in similar circumstances where global indicators and/or datasets have been successfully used at the national level.
    - Considering using open access and/or preferential rates and agreements for national level indicator developers.
    - Providing ongoing support, such as training and capacity building, to national level data users who may lack technical capacity.

# Contents

# 1.0 Introduction

## 1.1 Purpose and use of this information document

This Information document has been produced as an output of a United Nations Environment Programme-World Conservation Monitoring Centre (UNEP-WCMC) project, funded by the Federal Office for Environment (FOEN), Government of Switzerland, to examine how global datasets can be utilised to support national level implementation of the Strategic Plan for Biodiversity 2011-2020. The main objective of this information document is to improve the understanding of global indicator developers and data providers as to how global indicators or underlying data and observations can support the development of national biodiversity indicators. A Roadmap to provide support and guidance to national biodiversity practitioners (see Box 1), such as natural resource managers, has been produced to accompany this information document[1]. This Roadmap presents a framework to assist these practitioners by creating awareness of how and why global indicators and datasets, which are often generated at the national level, can be incorporated into updated NBSAPs, implementation plans and national reports.

**Box 1. Key Terms / Definitions**

**Indicators**

A metric or measure based on verifiable data that conveys information about more than itself. It is information packaged to communicate something important to decision makers[2]. Biodiversity indicators include the whole range from statistically robust and nationally sanctioned to indicators of change based on expert opinion (with varying degrees of verification).

**Underlying datasets**

Those datasets that contribute to the development of an indicator, without being directly accessible.

**Biodiversity practitioners**

Biodiversity and natural resource managers involved in policy processes influencing biodiversity outcomes.

Whilst many global datasets exist, both the Information Document and Roadmap focus on understanding how the global indicators brought together by the Biodiversity Indicators Partnership (BIP; see Box 2) can be utilised by countries in the development and implementation of their NBSAPs and further track progress towards 2020 and beyond.

The evidence base for this Information Document was principally compiled from two main sources:

- A review of the global indicators and their underlying datasets was undertaken in collaboration with the BIP partners
- An online questionnaire distributed via an official CBD Notification (**SCBD/SAM/DC/RH/KM/84530)** to Convention on Biological Diversity (CBD) National focal points and individuals involved in NBSAP revision.

**Box 2. The Biodiversity Indicators Partnership**

The CBD-mandated Biodiversity Indicators Partnership (BIP) was established in 2007 as a global initiative to promote and coordinate development and delivery of biodiversity indicators in

[1] Bowles-Newark, N.J., Despot Belmonte, K., Chenery, A., Misrachi, M. (2015). *Using global biodiversity indicators and underlying data to support NBSAP development and national reporting*. UNEP-WCMC In press.

[2] UNEP-WCMC. (2011). *Developing ecosystem service indicators: Experiences and lessons learned from sub-global assessments and other initiatives*. Secretariat of the Convention on Biological Diversity, Montreal, Canada. Technical Series No. 58.

support of the CBD and, subsequently, Multilateral Environmental Agreements (MEAs), the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), national and regional governments and a range of other sectors.

The BIP brings together over forty organizations working internationally on indicator development to provide the most comprehensive information on biodiversity trends. The BIP has also developed a set of resources to assist the development and use of indicators at the regional and national levels (available from: www.bipindicators.net). These resources include guidance documents, factsheets, a discussion forum for indicator practitioners and an e-learning module on 'Developing Biodiversity Indicators'.

## 1.2 Why use global indicators and/or datasets at the national level?

There is a growing body of evidence to demonstrate that a substantial amount of global biodiversity has already been lost, leading to considerable consequences for human well-being[3,4,5, 6,7,8,9,10.11,12,13]. The Strategic Plan for Biodiversity 2011-2020 sets a challenging and ambitious vision that biodiversity is fully valued and integrated into national decision making, and that concrete actions are taken to reverse biodiversity losses[14].

Biodiversity data are key to the successful development and implementation of National Biodiversity Strategy and Action Plans (NBSAPs), a fundamental conduit for implementing the Strategic Plan and developing national targets corresponding to the Aichi Biodiversity Targets. Nearly all of the seven steps advocated for NBSAP development and implementation require the use of biodiversity data in one format or another (Figure 1). Therefore a lack of national level biodiversity data can pose serious challenges for countries when developing and implementing an NBSAP, or preparing a National Report.



[3] UNDP (2014). *Human Development Report 2014 - Sustaining Human Progress: Reducing Vulnerabilities and Building Resilience*. UNDP, New York.

[4] UN DESA (2012). *A Guidebook to the Green Economy - Issue 2: Exploring Green Economy Principles*. UN DESA, New York.

[5] Millennium Ecosystem Assessment (2005). *Ecosystems and Human Well-being: Synthesis*. Island Press, Washington, DC.

[6] Balvanera, P., Pfisterer, A. B., Buchmann, N., He, J.-S., Nakashizuka, T., Raffaelli, D. and Schmid, B. (2006), Quantifying the evidence for biodiversity effects on ecosystem functioning and services. *Ecology Letters*, 9: 1146–1156

[7] Bernstein, A.S., (2014). Biological diversity and public health. Annual Review of Public Health, 35: 153-167

[8] Cardinale, B. J., Duffy, J. E., Gonzalez, A., Hooper, D. U., Perrings, C., Venail, P., … Naeem, S. (2012). Biodiversity loss and its impact on humanity. *Nature*, *486*: 59–67

[9] Díaz, S., Fargione, J., Chapin III, F.S. & Tilman, D. (2006) Biodiversity loss threatens human well-being. PLoS Biology, 4: 1300-1305.

[10] Haines-Young, R. & Potschin, M. (2010). The links between biodiversity, ecosystem services and human well-being. In: Raffaelli, D.G. & Christopher, L. J. Frid (Eds.) *Ecosystem Ecology*, pp. 110-139.

[11] Convention on Biological Diversity COP 10 Decision X/2: The Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets

[12] Secretariat of the Convention on Biological Diversity (2014). *Global Biodiversity Outlook 4*. Montréal, pp. 155.

[13] Tittensor, D. P., Walpole, M., Hill, S. L. L., Boyce, D. G., Britten, G. L., Burgess, N. D., … Parks, B. C. (2014). A mid-term analysis of progress toward international biodiversity targets. *Science*, 346: 241–244.

[14] https://www.cbd.int/sp/


**Figure 1. The seven steps of NBSAP development and implementation[15]**

Despite many countries being able to utilise different approaches to report on national-level progress towards the Aichi Biodiversity Targets[16], challenges still existed for many countries in making complete reports of progress towards the Aichi Targets when compiling their fifth national reports (5NR). In an assessment of 64 submitted 5NR, undertaken during the preparation of the Fourth Edition of the Global Biodiversity Outlook, just over 40% did not explicitly assess national progress towards the Aichi Targets. The CBD Secretariat updated these figures in June 2015 to

[15] http://nbsapforum.net/#nbsap-journey

[16] Chenery, A., Ivory, S and Despot Belmonte, K. (2015) Review of national approaches to assessing progress towards the Aichi Biodiversity Targets. UNEP-WCMC: Cambridge, UK.

include analysis of an additional 67 5NR – Figure 2 shows the percentage of these reports that did not contain information, even of a qualitative nature, to allow for an assessment of progress towards individual Aichi Targets.

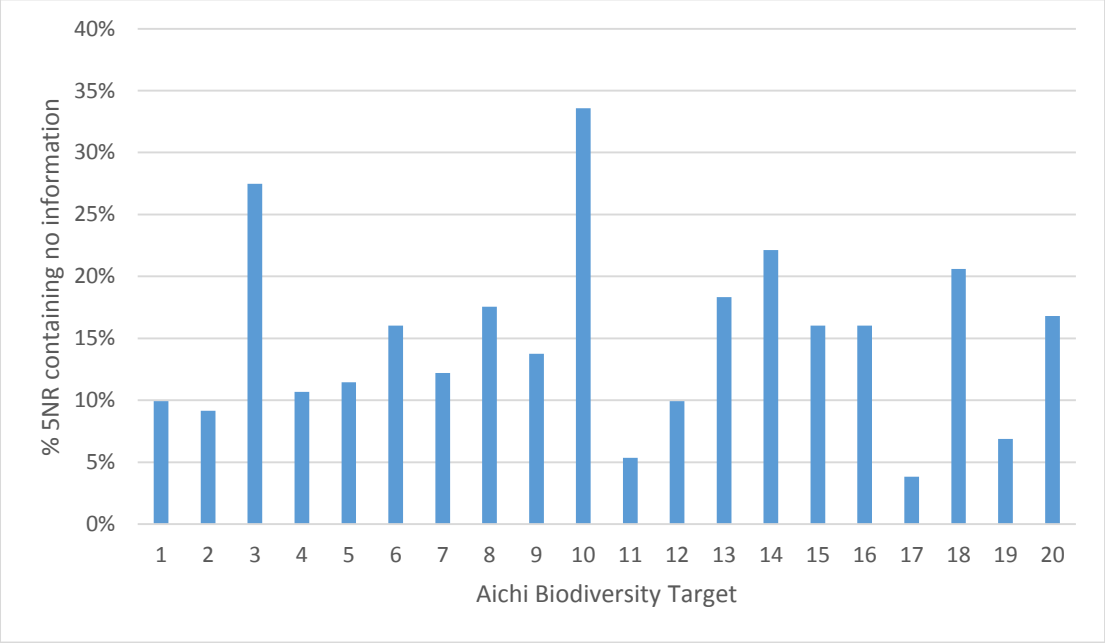



**Figure 2. Percentage of Fifth national reports containing no information on assessment of national progress towards individual Aichi Targets. Source sCBD, 2015.**

Despite global and national biodiversity indicators often being intended for different users and purposes[17], there are global indicators and/or datasets available that can provide opportunities to support national indicator development, national reporting, and NBSAP updating and implementation (see Table 1). Many of these indicators utilise datasets derived from national level monitoring, however due to barriers around political will and data sharing sensitivities, these data are not well integrated into national processes for biodiversity management, or national reporting. There is a growing body of evidence around these more complex issues within the environmental sector[18][19][20][21][22][23][24], however this information document intends to highlight the more technical, rather than political, barriers to the utilisation of global indicators and datasets, and demonstrate

[17] Bubb, P., Chenery, A., Herkenrath, P., Kapos, V., Mapendembe, A., Stanwell-Smith, D., and Walpole, M. (2011) National Indicators, Monitoring and Reporting for the Strategy for Biodiversity 2011-2020. UNEP-WCMC: Cambridge, UK

[18] Weichselgartner, J. & Kasperson, R. (2010). Barriers in the science-policy-practice interface: Toward a knowledge-action-system in global environmental change research. Global Environmental Change, 20, 266-277

[19] Bertzky, M., & Stoll-Kleemann, S. (2009). Multi-level discrepancies with sharing data on protected areas: What we have and what we need for the global village. Journal of Environmental Management, 90(1), 8-24.

[20] Dalal-Clayton, B. & Bass. S. (2009). The challenges of environmental mainstreaming: Experience of integrating environment into development institutions and decisions. IIED: London.

[21] Pereira, H. M., & Cooper, D. H. (2006). Towards the global monitoring of biodiversity change. Trends in Ecology & Evolution, 21(3), 123-129.

[22] Secades, C., O'Connor, B., Brown, C. & Walpole, M. 2014. Earth observation for biodiversity monitoring: A review of current approaches and future opportunities for tracking progress towards the Aichi biodiversity Targets. CBD Technical Series No. 72. Secretariat of the Convention on Biological Diversity, Montreal, Canada.

[23] Stephenson, P.J., Burgess, N.D., Jungmann, L., Loh, J., O'Connor, S., Oldfield, T., Reidhead, W. & Shapiro, A. (2015). Overcoming the challenges to conservation monitoring: integrating data from in situ reporting and global data sets to measure impact and performance. Biodiversity. DOI: 10.1080/14888386.2015.1070373.

[24] Tenopir, C., Allard, S., Douglass, K., Aydinoglu, A. U., Wu, L., Read, E., Manoff, M. & Frame, M. (2011). Data sharing by scientists: practices and perceptions. PloS one, 6(6), e21101.

ways in which global indicator developers can support national biodiversity practitioners within their work. This support can be provided in a number of ways:

1. Providing consistent, reliable information for decision making
2. Complementing national systems
3. Addressing capacity issues
4. Assisting in the ability to report on progress towards global targets

**Table 1. Global indicators available from the BIP suite to support national level reporting and/or NBSAP updating and implementation**

| Strategic Goal | **Global indicator** (all indicator information can be found at http://www.bipindicators.net/globalindicators) | Aichi Target | Indicator type | Aggregated from national or sub-national level data | Indicator/underlying dataset can be disaggregated at the national level |
|---|---|---|---|---|---|
| **A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society** | Biodiversity Barometer | 1 | Response | Yes | |
| | Ecological Footprint | 4 | Pressure | Yes | |
| | Red List Index (impacts of utilisation) | 4 | State | in some cases | Yes |
| **B: Reduce the direct pressures on biodiversity and promote sustainable use** | Extent of Forests and Forest Types | 5 | State | Yes | |
| | Marine Trophic Index | 6 | Pressure | Yes | |
| | Marine Stewardship Council Certified Catch and Fishery Improvements | 6 | Response | Yes | |
| | Red List Index (impacts of fisheries on marine species) | 6 | State | in some cases | Yes |
| | Area of Forest Under Sustainable Management: Certification | 7 | Response | Yes | |
| | Loss of Reactive Nitrogen to the Environment | 8 | Pressure | Yes | |
| | Nitrogen Deposition | 8 | Pressure | No | Yes |
| | Water Quality Index | 8 | State | ? | |
| | Red List Index (impacts of pollution) | 8 | State | in some cases | Yes |
| | Adoption of National Legislation Relevant to the Prevention or Control of Invasive Alien Species | 9 | Response | Yes | |
| | Trends in Invasive Alien Species Vertebrate Eradications | 9 | Response | No | Yes |
| | Trends in Numbers of Invasive Alien Species Introduction Events | 9 | Pressure | No | Yes |
| | Red List Index (impacts of invasive alien species) | 9 | State | in some cases | Yes |
| | Cumulative Human Impact on Marine Ecosystems | 10 | Pressure | Yes | |
| | Red List Index (reef-building coral species) | 10 | State | in some cases | Yes |
| **C: To improve the status of biodiversity by safeguarding** | Coverage of Protected Areas | 11 | State | Yes | |
| | Management Effectiveness of Protected Areas | 11 | Response | Yes | |
| | Protected Area Overlays with Biodiversity | 11 | Response | Yes | |

| **Strategic Goal** | **Global indicator** (all indicator information can be found at http://www.bipindicators.net/globalindicators) | **Aichi Target** | **Indicator type** | **Aggregated from national or sub-national level data** | **Indicator/underlying dataset can be disaggregated at the national level** |
|---|---|---|---|---|---|
| **ecosystems, species and genetic diversity** | Wild Bird Index | 12 | State | Yes | |
| | Living Planet Index | 12 | State | in some cases | Yes |
| | Red List Index | 12 | State | in some cases | Yes |
| | Wildlife Picture Index | 12 | State | Yes | |
| | Genetic Diversity of Terrestrial Domesticated Animals | 13 | State | Yes | |
| **D: Enhance the benefits to all from biodiversity and ecosystem services** | Red List Index (species used for food and medicine) | 14 | State | in some cases | Yes |
| | Nutrition Indicators for Biodiversity | 14 | State | Yes | |
| | Ocean Health Index | 14 | State | Yes | |
| | Red List Index (pollinating species) | 14 | State | in some cases | Yes |
| **E: Enhance implementation through participatory planning, knowledge management and capacity building** | Index of Linguistic Diversity | 18 | State | Yes | |
| | Status and Trends of Linguistic Diversity and Numbers of Speakers of Indigenous Languages | 18 | State | ?? | |
| | Number of Global Biodiversity Information Facility Records Over Time | 19 | Response | No | Yes |
| | Official Development Assistance Provided in Support of the Convention | 20 | Response | Yes | |

The need to utilise the global indicators has also been demonstrated through the eleventh meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD COP 11) decision XI/3[25], whereby Parties were invited to "*prioritize the application at national level of those indicators that are ready for use at global level where feasible and appropriate*" and the Biodiversity Indicators Partnership (BIP) was requested to "*develop practical information on the indicators… to assist in the application of each of the indicators*".

In addition to reporting on progress towards international Multilateral Environmental Agreements (MEAs) such as the CBD, indicators can be used to highlight priority areas to be addressed through government policy making and implementation. Indicators allow policy makers and other actors to be more sensitive to changes in the natural environment, and to continually increase the efficacy of biodiversity management interventions[26]. Limited availability of data for the production of national indicators impedes the ability of policy makers to adequately account for biodiversity and ecosystem services within their processes. Therefore, where indicators are lacking, science and policy remain disconnected. Equally, global indicators utilise a wealth of global, regional and national datasets in their development, yet there is a lack of understanding of how these indicators or their underlying data can be mobilised to support national biodiversity planning and monitoring.

In a study conducted by NatureServe[27], 132 local conservation experts from three geographically diverse regions of critical biodiversity concern (the Tropical Andes, the African Great Lakes, and the Greater Mekong) were surveyed in order to better understand the challenges to effective biodiversity monitoring at national and regional scales and investigate national perceptions of the benefits of utilising global data. Most cited benefits included the ability to: collect, share and analyse information; assess biodiversity status and threats; inform policy planning and decision making; and assess and improve conservation impacts and ecosystem services (see Figure 4). The results of these studies were used to create a Biodiversity Indicators Dashboard (see Box 3).

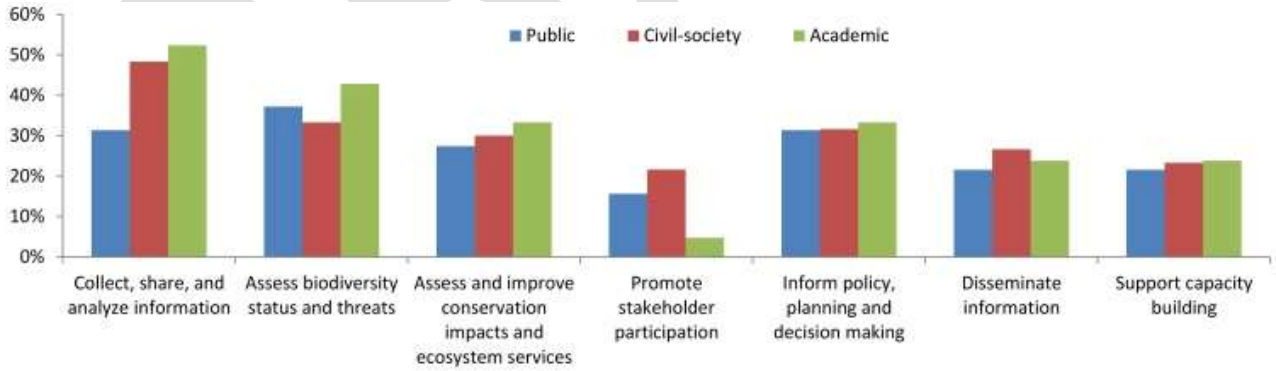



**Figure 4. Perceived benefits of using global data within a dashboard approach, by sector. Number of respondent is 51 for public sector, 60 for civil-society, and 21 for academic sector[27]**

[25] https://www.cbd.int/doc/decisions/cop-11/cop-11-dec-03-en.pdf
[26] https://www.cbd.int/indicators/intro.shtml
[27] Xuemei, H., Smyth, R.L., Young, B.E., Brooks, T.M., Sánchez de Lozada, A., Bubb, P., Butchart, S.H.M., Larsen, F.W., Hamilton, H., Hansen, M.C. & Turner, W, R. (2014). A biodiversity indicators dashboard: Addressing challenges to monitoring progress towards the Aichi Biodiversity Targets using disaggregated global data. PLOS One DOI: 10.1371/journal.pone.0112046

**Box 3. The Biodiversity Indicators Dashboard.**

Using this framework, NatureServe has created a Biodiversity Indicators Dashboard that enables users to track indicators of biodiversity and conservation performance data, in a clear, user-friendly format. Four global indicators were disaggregated to the regional and national level to prove the concept. The four indicators measure:

- Pressure on biodiversity (deforestation rate)
- State of species (the IUCN Red List Index)
- Conservation response (Key Biodiversity Areas)
- Benefits to human populations (freshwater provision)

Additional Indicators of disaggregated global datasets or regional generated are further developed through Biodiversity Indicators Dashboard and can be visualized at http://dashboard.natureserve.org.

The Dashboard analyses three regions—the tropical Andes, the Great Lakes of Africa, and the Mekong River Valley—and their component countries (see Figure 5). These visualizations include charts that show regional and national trends in biodiversity. The tool helps: track progress toward the Aichi Targets; supports national monitoring and reporting; informs outcome-based policy-making that protects natural resources and allows for direct comparison between countries within the three focal regions.


**Figure 5** Screenshot of the NatureServe Biodiversity Indicators Dashboard showing the three focal regions.

The next section discusses the current use of global biodiversity indicators and datasets at the national level by elaborating on the key barriers identified through a survey of CBD focal points (see Section 2). In the final section we present examples of how some of the identified barriers have been overcome and propose a series of options for both global data providers (such as the BIP Partners) and national users (such as indicator developers and biodiversity practitioners) regarding the opportunities presented by utilising global datasets at the national level.

## 2.0 The current use of global biodiversity indicators and datasets at the national level

In order to assess the current use of global biodiversity indicators and datasets at the national level, an online questionnaire was distributed via an official CBD Notification[28] to CBD National focal points and individuals involved in NBSAP revision. Survey respondents were requested to provide information on the following[29]:

- *Have they used/ are they using global indicators and/or datasets in the preparation of NBSAPs or national reports?*

*If yes:*

  - *Which indicators and/or datasets did they use?*
  - *Did they encounter any problems using these indicators and/or datasets?*

*If no:*

  - *What were the barriers to using these indicators and datasets?*
  - *What would give them the confidence to use these indicators or datasets in the future?*

Of the 49 survey respondents, 28 (57%) stated that they have not used global indicators and/or global datasets in the preparation of their NBSAPs or National Reports. Of those 21 (43%) respondents who stated that they had used global indicators and/or datasets, 71% (15) maintained that they would consider using additional global indicators or datasets in the future. This suggests that those that have used global indicators or datasets have found this to be a mostly positive experience.

Respondents elaborated further on their use of global indicators and /or datasets, with the IUCN Red List Index being the most commonly cited (4), with the Ecological Footprint, Marine Trophic Index and Global Wild Bird Index also being used at the national level.

### 2.1 Key Barriers to the use of global indicators and/or data at the national level

Through analysis of the survey responses, five key constraints and barriers were identified regarding the use of global indicators and/or datasets at the national level.

**Barrier 1: "*Uncertainty regarding the coverage* [and] *sensitivity of indicators and datasets at the global scale for national or sub-national reporting*".**
There were concerns and uncertainty over the quality of the indicators, particularly their geographical and temporal coverage, and the sensitivity of the indicators/datasets to respond to national level changes.

**Barrier 2: "*Uncertainty regarding the… applicability of indicators and datasets at the global scale for national or sub-national reporting*".**
A number of respondents were unsure of how global indicators and datasets could be utilised at the national level for monitoring implementation of their NBSAPs.

**Barrier 3: "*Uncertainty regarding the value added by global indicators and datasets to national or sub-national indicators and datasets*".**
Countries expressed uncertainty regarding the added value global indicators and datasets could provide to their NBSAPs or biodiversity-related assessments.

[28] SCBD/SAM/DC/RH/KM/84530
[29] For the complete questionnaire see Annex 1.

**Barrier 4: "*Availability and accessibility of data taken from global dataset have been deemed too difficult/poor*"**
Respondents were unsure of how to gain access to information concerning the use of global indicators and datasets at the national level. Limited access to global datasets was also noted as a constraint.

**Barrier 5: "[Lack of] *technical capacity*"**
Respondents stated that their respective countries did not have the technical capacity needed to utilise global indicators and datasets for their national level indicator development and/or assessments.

Those respondents from upper middle and high income countries were mostly concerned with the relevance of the global indicators at the national level (Barrier 2). Whereas those from lower middle and low income countries had concerns around the level of technical capacity required in order to utilise global indicators and datasets (Barrier 5). Each of these barriers will now be discussed and potential options for future support suggested for both national level data users and global level data providers.

# Section 3.0 Options for future support

## 3.1 Global level data providers

When asked if they would be interested in collaborating with members of the Biodiversity Indicators Partnership (BIP) to examine how global indicators and/or datasets could be used in their NBSAP or National Reports, 32 survey respondents (65%) answered positively. Of these respondents, only 15 of those (47%) currently use or have used global indicators or datasets in the preparation of NBSAPs or National Reports. This analysis suggests that, while there is existing national appetite for investigating the potential of global datasets, channels of communication need to be strengthened in order to promote the availability and benefits directly to potential national level users. This is the first step that global level data providers can take towards to addressing the five barriers highlighted by survey respondents.

The instigation of pilot studies at the national level will allow for the continued development of data quality and verification processes. This testing of global indicators and datasets could also provide the scope for a robust comparison between global and national indicators. For example, the Living Planet Index (LPI) is not only a global index but can also be calculated for regions and nations, provided that there are sufficient data available. LPIs have been produced for a number of different regions and countries including Uganda, Canada, the Mediterranean Wetlands and the Arctic (see Box 4). The publication of study results, including information on applying global indicator methodologies at the national level, will serve to allay concerns over the quality of global indicators and datasets (**Barrier 1**).

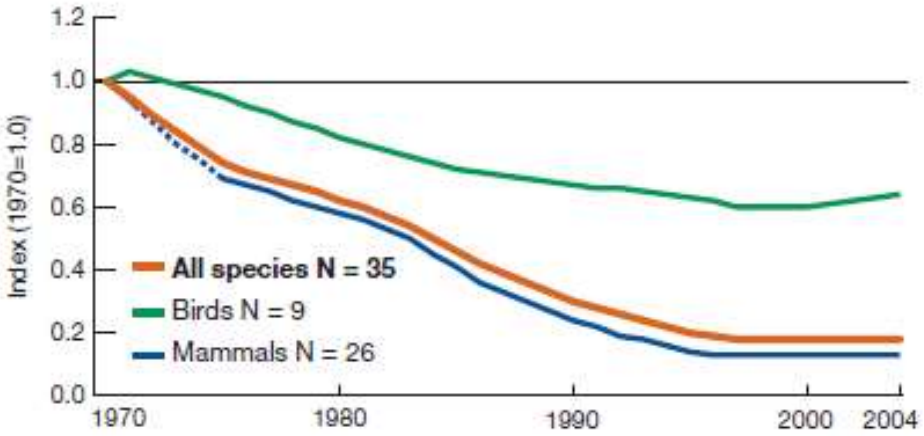
**Box 4. The Living Planet Index for Uganda**

The Living Planet Index (LPI) is an indicator of change in global biodiversity based on change in population abundance of vertebrate species from all around the world. Biodiversity is perhaps most widely understood at the species level, so as a measure of trends in species abundance the LPI has a high degree of resonance with decision makers and the public and links clearly to ecological process and ecosystem function.
The global LPI database can be disaggregated for subsets of data to:

- show trends in species abundance for particular taxonomic groups;
- show trends in species abundance for particular habitats or biomes;
- identify regions and ecosystems where the abundance of species is changing most rapidly;
- explore trends in abundance of species impacted by different threat processes;
- monitor trends in species listed on conventions such as Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) or the Convention on Migratory Species (CMS).

Makerere University in Uganda has been producing 'State of Uganda's biodiversity' reports since 1998 (Pomeroy *et al*. 2006), using the LPI method to analyse trends and providing a regular input of data into the LPI database. Despite Uganda's recurring political and economic problems over the last four decades, monitoring of at least some species (mainly large savannah ungulates but also some forest primates and wetland species), has been undertaken since the 1960s. From these limited data sets, it has been possible to construct a series of indices using the LPI method, showing the decline in the abundance of certain species in the country's natural ecosystems from 1970 to 2004. The Living Planet Index for Uganda combines the trends from the species population indices of Uganda's forests, freshwaters and savannahs. The savannah data set is relatively extensive, comprising whole-country estimates for populations of 16 species of large mammal, while the data sets for forests and freshwater are smaller and less comprehensive (five and four species respectively.

**Figure 2: The Living Planet Index for Uganda 1970-2004, showing the disaggregated bird and mammal indices**




At present, data submitted by nations and regions must be sent directly to the responsible organisations for the LPI, WWF International and the Zoological Society of London (ZSL). Work has now been completed to make the database available online in the form of the Living Planet Database (www.livingplanetindex.org) with a view to encourage nations and regions to submit their data to produce both their own indicators and strengthen the global indicator.

Source: McRae, L., Loh. J., Bubb, P.J., Baillie, J.E.M., Kapos, V., and Collen, B. 2008. The Living Planet Index - Guidance for National and Regional Use. UNEP-WCMC, Cambridge, UK.

Global level data providers can facilitate the sharing of lessons between countries that have successfully integrated their indicators and/or datasets with countries in similar circumstances (i.e. geographical location or technical capacity). This type of knowledge transfer will allow for the applicability of global indicators and datasets for national level reporting to be demonstrated to national level users, addressing those concerns in **Barrier 2,** as well as highlighting the value provided at the national level by these data (**Barrier 3**). The more potential national level users that can be reached via this strategy, the more comparability there will be between countries with regards to progress towards global targets, something highlighted as desirable by two survey respondents:

> *"Use of global indicators would be encouraged by the expectation that same indicators would be used by all other partners in order to have comparison among different countries".*

> *"[I would have the confidence to use global indicators] if the data could be disaggregated to national level and would allow the comparison of neighbouring countries, for example".*

Increasing the relevance of global indicators to users at the national level, by taking into account national needs and priorities, allows for the use of common indicators at multiple scales[30]. The Wild Bird Index is an example of an indicator used at the national, regional and global level (Box 5).

[30] http://nbsapforum.net/uploads/1387.pdf

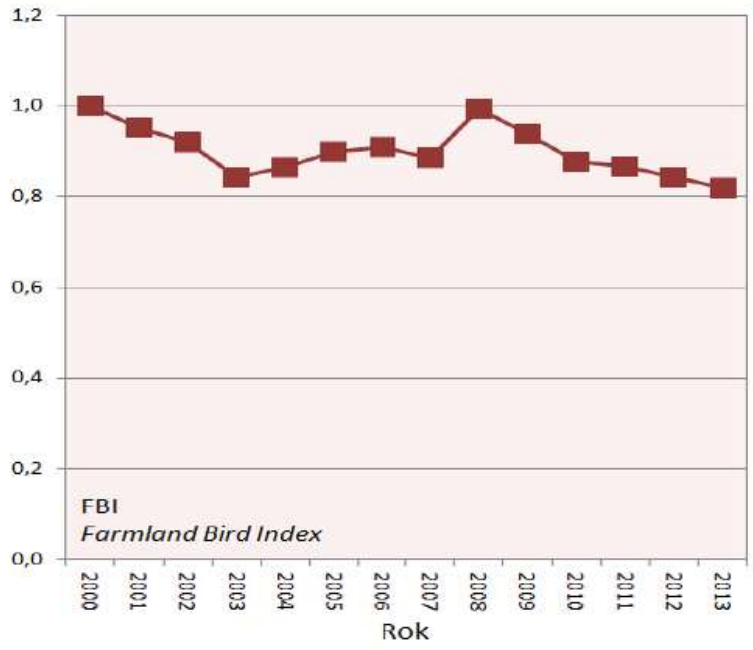
**Box 5. The Wild Bird Index**

Birds are recognised as good indicators of environmental change and as useful proxies of wider changes in nature. The Wild Bird Index (WBI) measures average population trends of a suite of representative wild birds, as an indicator of the general health of the wider environment. WBIs deliver scientifically robust and representative indicators for birds to support formal measurement and interpretation of national, regional and global targets to reduce, or halt, the rate of biodiversity loss.

The WBI project aims to promote and encourage the development of WBIs from national population monitoring schemes. Where such schemes already exist, it will coordinate and facilitate the collation of bird species' data and the generation of indices and indicators. Where there are none, it will provide tools and support to implement similar data collation and synthesis in a representative set of countries across regions, with the funds available to the project.

The Wild Bird Index was approved in October 2004 by the European Commission as one of the official structural indicators for changes in EU member states. In order to assess and report on the state of agricultural areas, Poland used an aggregated index of common farmland bird species population abundance in their fifth national report[31]. A general long-term decreasing trend was found (Figure 6), tentatively attributed to factors related to the intensification of agriculture, such as the accumulated and/or delayed effects of increasing agricultural engineering. WBIs are being used at the national level in at least 25 other European countries, including Austria, Belgium (Wallonia), Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italia, Latvia, Luxembourg, Netherlands, Norway, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, and UK.

FIGURE 15. COMMON FARMLAND BIRD POPULATION ABUNDANCE INDEX (FBI 23)




Source: CIEP (2014)

[31] https://www.cbd.int/doc/world/pl/pl-nr-05-en.pdf

A regional WBI for Europe has already been produced and is being used to measure progress towards the headline target of the new EU Biodiversity Strategy to 2020 - Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss[32]. WBIs have also recently been published for North America, and these two aggregated indices were combined to produce status and trends information towards global achievement of Aichi Target 5 for the fourth edition of the Global Biodiversity Outlook (figure 7).

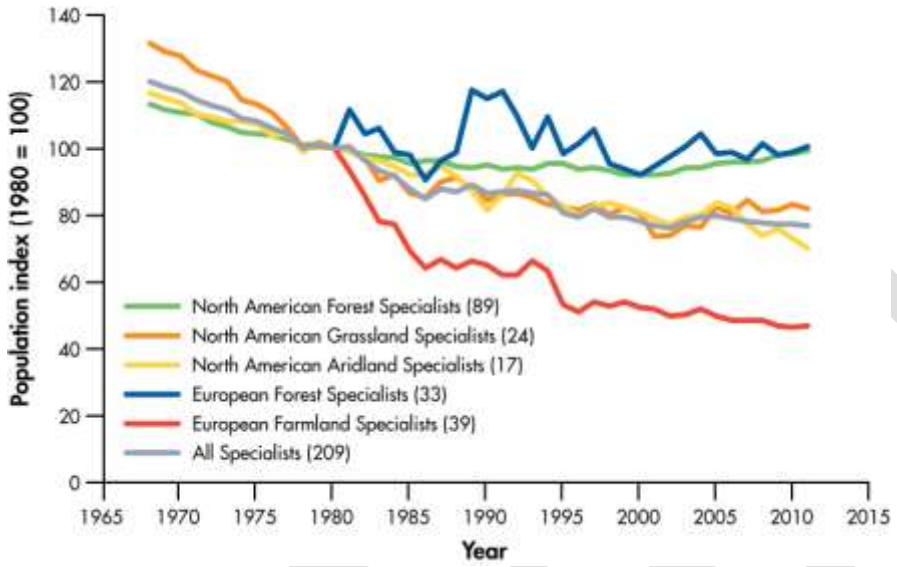



**Figure 7 The Wild Bird Index for 209 habitat-specialist bird species in Europe and North America, showing the average population trends of specialist birds have declined by more than 20% since 1980, based on continental-scale systematic surveys and monitoring schemes.** Sources: EBCC/RSPB/BirdLife/Statistics Netherlands; Sauers et al. (2014).

Wild Bird Index initiatives have begun in Africa (particularly in Botswana, Kenya and Uganda), Australia and China. The Global Wild Bird Index, will be comprised of these aggregated national level indexes and will continue to expand, hopefully into a truly global indicator.

For more information about producing regional and national Wild Bird Indices, contact Richard Gregory from RSPB and/or Ian Burfield from BirdLife International.

Although many of the global indicators and datasets are freely available via online tools or downloadable content, the limited access to some of these data has been emphasised by survey respondents (**Barrier 4**). Global data providers could consider, where feasible, allowing for open access to data for national level data users (see Box 6). Creating specific data sharing and use agreements for these data users would help protect the interests of global data providers, while allowing for the data to be used at the national level.

**Box 6 BirdLife Data Zone: Country Profiles**

BirdLife International have developed an open access web portal displaying scientific data on the world's bird species and the sites critical to their conservation. Through the Country Profiles,

[32] http://ec.europa.eu/environment/nature/info/pubs/docs/brochures/2020%20Biod%20brochure%20final%20lowres.pdf

these data can be obtained at the national and territorial levels, as well as relevant policy information, and access to additional resources and publications. The portal was specifically designed to provide information and assistance to countries in developing their NBSAPs and for national reporting.


**Screenshot of the BirdLife Country Profile for Cambodia.**

Source: BirdLife International (2015) Country profile: Cambodia. Available from: http://www.birdlife.org/datazone/country/cambodia.

There is a perceived lack of technical capacity at the national level to incorporate global indicators and/or datasets into NBSAP implementation and national reporting processes, as stated by survey respondents (**Barrier 5**). Therefore, where global data can be identified as readily applicable, available and accessible, efforts should be made to alleviate capacity issues to address this barrier at the national level.

Producing national level indicator development guidance materials in a range of languages that are available offline (either hard copy or downloadable) is a relatively easy step that can be taken, providing a quick win both in terms of filling national level data gaps and tailoring of global indicators and datasets. The BIP have developed an 'Indicator Toolkit', designed to be a one-stop-shop for indicator practitioners. The toolkit offers easy access to guidance, help and support to national indicator developers, including guidance documents for specific BIP indicators, developed to assist users in producing these indicators at the national level[33]. The Roadmap document, produced

[33] http://www.bipindicators.net/nationalindicatordevelopment

alongside this information document, also contains information on each of the global indicators from the BIP suite that are currently available for use at the national level (see Table 1).

## 3.2 National level indicator developers

There are currently 34 indicators available from the BIP global indicator suite that are ready for use at the national level (see Table 1). These cover 17 of the 20 Aichi Targets. All BIP global partners stated that they would be interested in supporting national stakeholders in reproducing their respective indicators at the national level. Where national indicators are limited or missing, global indicators can be disaggregated and used at national level, or global indicator methodologies can be applied at the national level. For example national Red List Indices (RLIs) can be calculated either by disaggregating the global indices, or by repeatedly assessing extinction risk at the national scale, and many countries have compiled national red lists which form the basis of the latter approach (see Box 7).

**Box 7 The Red List Index**[34]

The Red List Index (RLI) shows trends in the extinction risk of sets of species. It requires data from repeated assessments of species using the Red List categories and criteria, which are available for many more species than detailed reliable time-series of population abundance data. Because such data are generally available for entire suites of species (e.g. all species worldwide in a particular taxonomic group, or all regularly occurring species in a country for a particular taxonomic group) they produce potentially less-biased indicators than those based on a subset of better-studied species.

More information about producing national RLIs can be found in the publication, IUCN Red List Index – Guidance for National and Regional Use available from: https://cmsdata.iucn.org/downloads/rli_guidelines_final_4march09_1.pdf

There are at least 515 national Red Lists for various taxonomic groups, covering at least 122 countries, of which Red Lists for 43 countries are available online at http://www.nationalredlist.org. However, not all these use the Guidelines for application of the IUCN Red List Categories and Criteria at regional and national scales, so results may not be comparable between countries.

It is important to recognize that global datasets cannot always replace local or national data, especially in smaller countries in more remote locations as described by these two respondents:

> *"The confined territory of* [my country] *make global Indicators ineffective in catching the specifics of the national biodiversity trends. Global indicators are helpful to compare the national situation to the overall global situation and to give hints on the scientific data collection for a certain indicator, however for measuring specific national trends, the spatial scale is too wide and national indicators are better suited for our evaluation".*

> *"When evaluating national development it seems most appropriate to use data from national level.* [My country] *has relatively good national data sources. Because of specific circumstances (northern location, low population density etc.) many of the global and even regional issues are not that relevant in* [my country]*".*

[34] www.nationalredlist.org

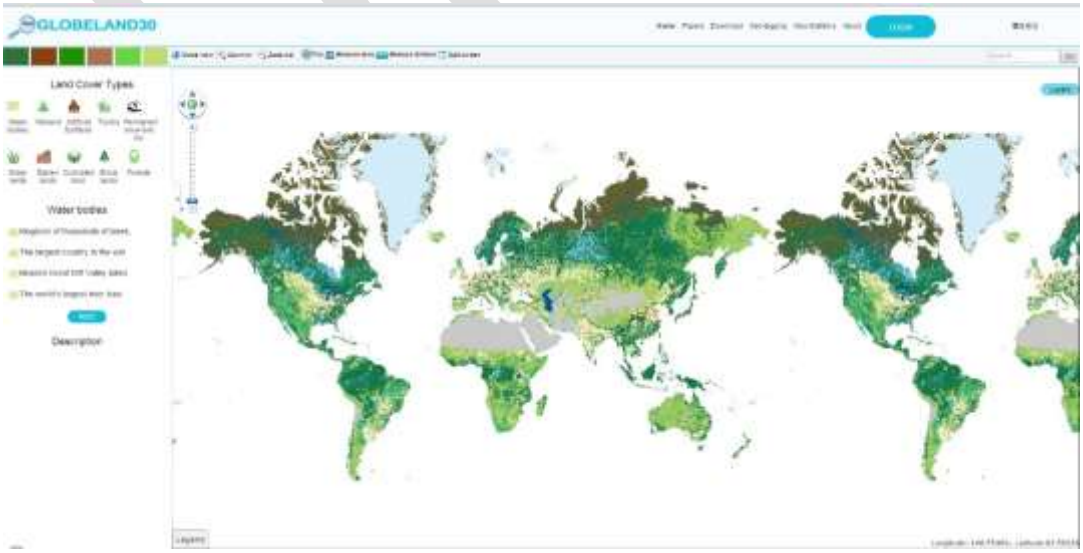
Respondents to the survey expressed concerns over the quality of global indicators and datasets, particularly their geographical and temporal coverage and the sensitivity of the indicators/datasets to respond to national level changes (**Barrier 1**).

Where national information is limited or missing, global datasets can supplement national datasets in order to monitor biodiversity and assess progress towards meeting conservation targets. Available data from satellite remote sensing, for example, could be used to monitor progress on national and international targets. However national level capacity to verify and use these data, together with issues around political will, can make the integration of global datasets problematic. Data derived from satellite remote sensing can provide estimates on land cover, forest areas and water provision (for example annual estimates of tree-cover are now freely available at 30m resolution globally – see http://www.globalforestwatch.org/). These datasets can be coarse in resolution or differ depending on the data sources, however efforts are being made by the providers of global remote sensing products to enhance access, continuity and affordability for national level users, and this includes increasing resolution[35]. In areas where there is less capacity for *in situ* monitoring, or where national level information is not available or accessible, high resolution global datasets can be used to complete the picture in combination with national level datasets. One of the highest resolution global datasets, GlobeLand30, is freely available in order to promote scientific data sharing in the fields of Earth observation and geospatial sciences (see Box 8).

**Box 8 GlobeLand30 land cover tool**

In 2014 China donated the first open-access, high-resolution map of Earth's land cover (named GlobeLand30), to the United Nations, as a contribution towards global sustainable development and combating climate change. Datasets at 30-metre resolution were collected for the map, making them valuable for monitoring environmental changes and for resource management at global, regional and local scales.

The GlobeLand30 data sets are freely available and comprise ten types of land cover, including forests, artificial surfaces and wetlands, for the years 2000 and 2010. They were extracted from more than 20,000 Landsat and Chinese HJ-1 satellite images (see www.globallandcover.com).




[35] Turner, W., Rondinini, C., Pettorelli, N., Mora, B., Leidner, A. K., Szantoi, Z., Buchanan, G. et al. 2015. Free and open-access satellite data are key to biodiversity conservation. Biological Conservation, 182, 173-176.

Source: Chen Jun, Yifan Ban, Songnian Li, 2014, China: Open access to Earth land-cover map, Nature, 514:434, 23 Oct. 2014.

Those global indicators included in the suite brought together under the BIP are often used within peer reviewed literature and for published statistical analyses. For example the global indicators brought together under the BIP were utilised in two main ways to support the Fourth Edition of the Global Biodiversity Outlook (GBO-4), a mid-term assessment of progress towards implementation of the Strategic Plan for Biodiversity 2011-2020: Firstly, updates for 37 of the 48 listed BIP indicators, were provided to the production team, for the development of storylines within the status and trends sections of the Aichi Target chapters. Secondly, an indicator synthesis was produced in which more than 100 datasets were identified as candidate global indicators to be extrapolated to 2020. Those indicators, from the BIP and non-BIP sources, that were retained for the GBO-4 analysis were selected using a set of criteria (Table 2) that were designed to ensure the suitability and credibility of the indicators, while still ensuring that they were sufficiently data-rich for statistical extrapolation. Criteria were:

**Table 2. Criteria used to identify indicators for use in the GBO-4 extrapolation to 2020 analysis.**

| **Criteria used to identify which BIP and non-BIP indicators were incorporated in the GBO-4 extrapolation to 2020 analysis** | |
|---|---|
| I. | Relevance to the Aichi Target |
| II. | Scientific and institutional credibility, either through publication in the peer-reviewed literature or through having an institutional basis |
| III. | An end data point after 2010, although this was relaxed where an Aichi Target had few indicators or where an indicator was particularly relevant |
| IV. | At least 5 data points |
| V. | Broad geographic coverage |

The resulting indicator extrapolations formed one of the main sources of information supporting the production of GBO-4 and they were also published in the Scientific Journal, Science (Tittensor et al. 2014). Applying the peer-reviewed methodology of a global indicator to nationally derived data can assist in the production of more robust indicators at the national level (see Box 9). However Bubb et al (2011)[17], highlighted the following considerations for the application of global indicator methodologies at the national level:

> *"All the global headline indicator methods can in principle be applied at national scale, but such an application requires an understanding of their scientific concept and data requirements. This is most straightforward for the global indicators which rely on data reported at the national level, such as coverage of protected areas and extent of forests, and which are area-based measures. For some global indicators there are conceptual issues which need to be considered before their application at national level. For example, this is the case for the Red List Index and River Fragmentation, where the unit of analysis may well not fit within national boundaries, such as the global population of a species covering many countries, or a multi-national river system. A national calculation for these indicators would first need to determine the appropriate scale and boundaries for including data, such as nationally endemic species, discrete national populations of species, or river basins and sub-basins".*

**Box 9 Applying a peer-reviewed methodology – the Index of Linguistic Diversity**

Traditional environmental knowledge is expressed and transmitted largely through language. If a language is in decline that generally means that the knowledge it conveys is also in decline. Current data in the Index of Linguistic Diversity (ILD) database could be used to provide a first-cut picture of national linguistic diversity. If finer-grained data from the national level (e.g., dialect censuses) is available, it could be fed into the ILD methodology to provide a much more detailed picture of national linguistic diversity.

The ILD depends on estimates of speaker numbers, which are known to vary widely in quality. The ILD uses data-filtering techniques to try to eliminate those data points that are most likely to be anomalous. The reliability of speaker numbers is something that has to be accounted for at all levels, from global to national. The ILD can be applied nationally and regionally. No change in methodology is needed, just the relevant data.

*Source: Loh, J. and Harmon, D. 2014. Biocultural Diversity: Threatened species, endangered languages. WWF Netherlands*

National data can play a significant role in supporting analyses that track progress towards the Aichi Targets (**Barrier 2**). However, where national biodiversity information is fragmented between different national agencies, monitoring and reporting on conservation efforts is hindered. In cases where national level data has been aggregated in order to create a global indicator, it may be that the corresponding national level data holders are not well connected to the NBSAP or national reporting process. For example, during an assessment of the fourth national reports (4NR)[17], it was found that the 'Extent of forests and forest types' indicator was used in the 4NR by only 50 countries, despite many more than this having reported these data to the FAO Forest Resource Assessment. Accessing global datasets in order to identify where these data may originate from can assist in the integration of these national datasets, however this is not purely a technical issue. Political sensitivities and willingness, as well as poor linkages between national government departments, agencies and institutions, all play a part in limiting the sharing and use of national datasets[36].

National level practitioners have stated some concerns over the added value that global indicators and datasets can provide to NBSAPs and biodiversity-related assessments (**Barrier 3**). In cases where the disaggregation of a global indicator, or the application of a global methodology, are not relevant at the national level, there may still be underlying datasets that can be used to support the development of national indicators or in national assessments.

Easy access to biodiversity datasets for monitoring and reporting is needed at multiple scales. However, there are a number of methodological and logistical challenges in regards to the collection and sharing of data. In terms of data collection there is a lack of consistency on methodologies and statistical analyses at national and global levels, and in some cases inadequate capacity or expertise to collect data *in-situ*.

Biodiversity monitoring involves data-intensive and science-driven processes, yet there are capacity gaps in terms of generation, management and dissemination of information at the national level that need to be addressed. Countries face a number of challenges that impact effective conservation monitoring and reporting; these challenges include lack of technology, limited financial resources

[36] UNEP/CBD/COP/11/INF/8

(resource allocation), lack of personnel (staff on-the-ground, technical knowledge, processing expertise), limited access to information (**Barrier 4**), and interoperability issues. In terms of data sharing, some of the challenges include the cost of acquiring data, data processing and access policies. CBD Parties are encouraged to use available global datasets as well as sharing their own data in order to harmonise monitoring systems. Countries can benefit from support with data management, standardised scientific methods, data analysis, and indicator development (**Barrier 5**). Global data sets and associated data may assist countries to bypass national capacity barriers and provide valuable information to monitor progress and inform conservation policy.

## 4.0 Conclusion

Global indicators, datasets and methodologies can be usefully applied at the national level in order to support indicator development, NBSAP implementation and policy and decision making processes. In some cases, these data have been derived from national level monitoring programmes, however there may be poor linkages between organisations and agencies, limiting the use of these data for NBSAP implementation and national reporting. Global data should not be used in replacement of data collected *in situ*, but rather be used as an effective way to fill gaps in information at the national level, and for enhancing the use of indicators at multiple scales.

Providing biodiversity practitioners, and other national level data users, with the confidence to use global indicators and datasets can contribute to the provision of more complete, and comparable, national reports. In turn it will allow an additional conduit through which global level data providers can better tailor their products to be more useful, specifically at the national level, and encourage the collection of national level data using standardised methodologies. The options presented for both global level data providers and national level indicator developers, will facilitate the use of global indicators and datasets where appropriate, boosting comparability between countries and creating a more accurate representation of national progress towards global targets for reports such as the Global Biodiversity Outlook.

## Annex 1. Survey Questions

**Introduction**

Thank you for contributing to this survey, which is being conducted by UNEP-WCMC in collaboration with the Secretariat of the Convention on Biological Diversity. The survey has two sections. The first section relates to the different approaches used by countries to assess progress towards the Aichi Biodiversity Targets in their 5th National Reports. The second section examines how countries use or could use global level data to support monitoring of the Strategic Plan for Biodiversity 2011-2020.

The survey results will support the preparation of background documents for the Ad Hoc Technical Expert Group (AHTEG) on indicators for the Strategic Plan for Biodiversity 2011-2020. The AHTEG is being held in response to paragraph 20(b) of decision XII/1 and with the generous financial support of the European Union and the Government of Switzerland. The results will also be used to support the development of a Road Map to support NBSAP practitioners in using global datasets to support national biodiversity monitoring. All documents will be made available to survey respondents for comments before release.

**Section 2: Using global level data to support monitoring of the Strategic Plan for Biodiversity**

12. Have you used global indicators and/or global datasets in the preparation of your NBSAP or National Reports? (A global indicator refers to a specific measure which provides information on the status or trends of biodiversity at the global level. These indicators are based on data sets which cover large parts of the world and in some cases be disaggregated into national or regional information).

13. Which datasets/indicators have you used?

14. Would you consider using additional indicators and datasets in the future?

15. Did you encounter any problems in the use of these indicators/datasets?

16. What were the barriers to your use of global indicators and/or datasets? (i.e. technical capacity, accessibility of data, limited coverage)

17. What would give you the confidence to use these indicators/datasets in the future?

18. Are you aware of the list of indicators identified in COP decision XI/3 and the factsheets on indicators brought together by the Biodiversity Indicators Partnership (BIP: www.bipindicators.net)?

19. If yes: Would you be interested in examining, in collaboration with members of the Biodiversity Indicators Partnership (www.bipindicators.net) how these could be used in your NBSAP or National Reports