



Indicator development

Using indicators to support target & strategy development & reporting

*Regional Workshop for East, South and Southeast Asia
on Updating National Biodiversity Strategies and Action Plans*

Xi'an, China; 9 -16 May 2011

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UNEP World Conservation Monitoring Centre

www.bipindicators.net



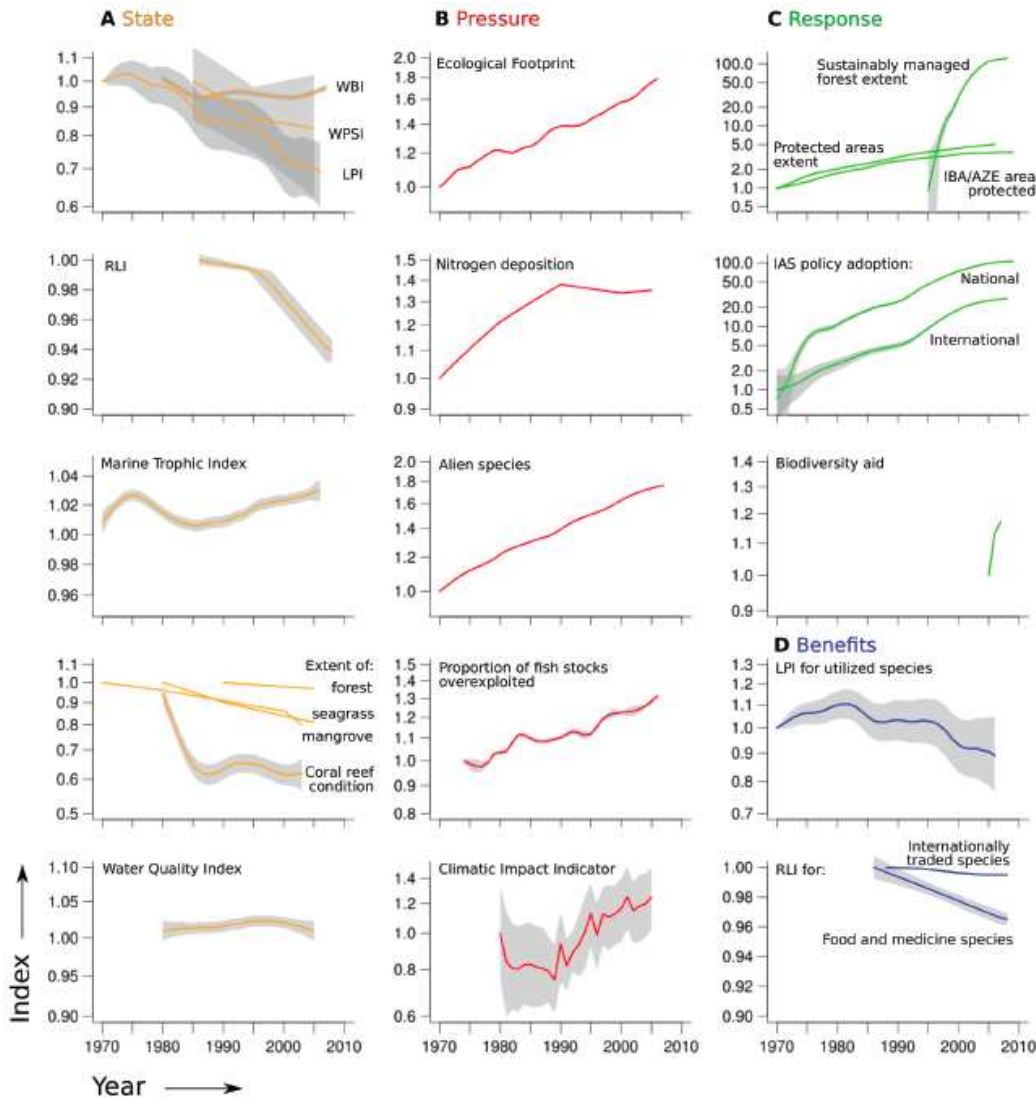


For more information:

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Butchart *et al.* (2010) Global biodiversity: indicators of recent declines, *Science* 328: 1164-8

Capacity building workshops

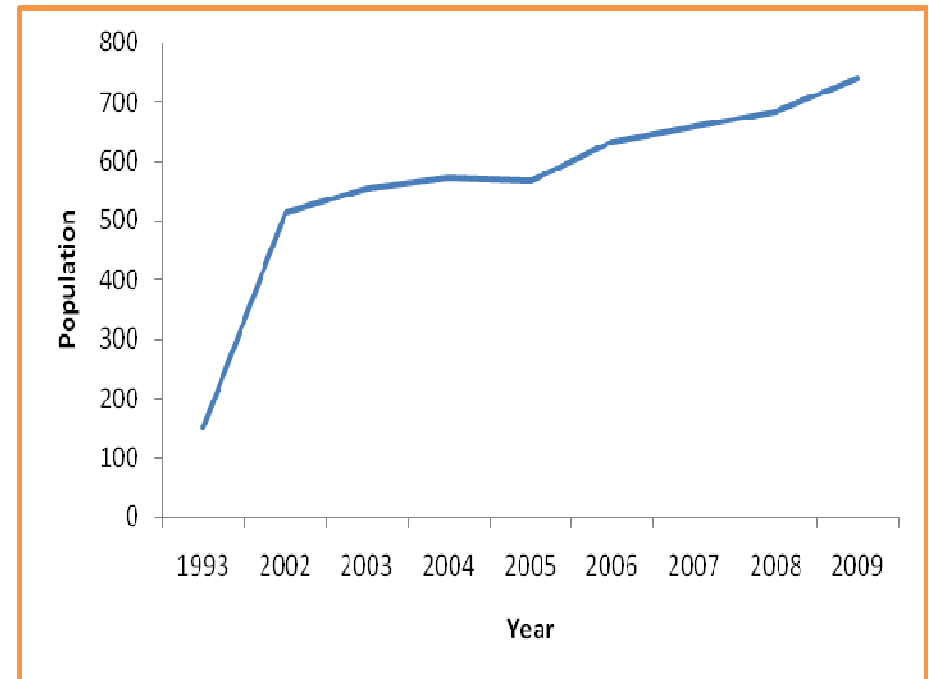


Example of a biodiversity indicator #1



Walia Ibex population in Ethiopia

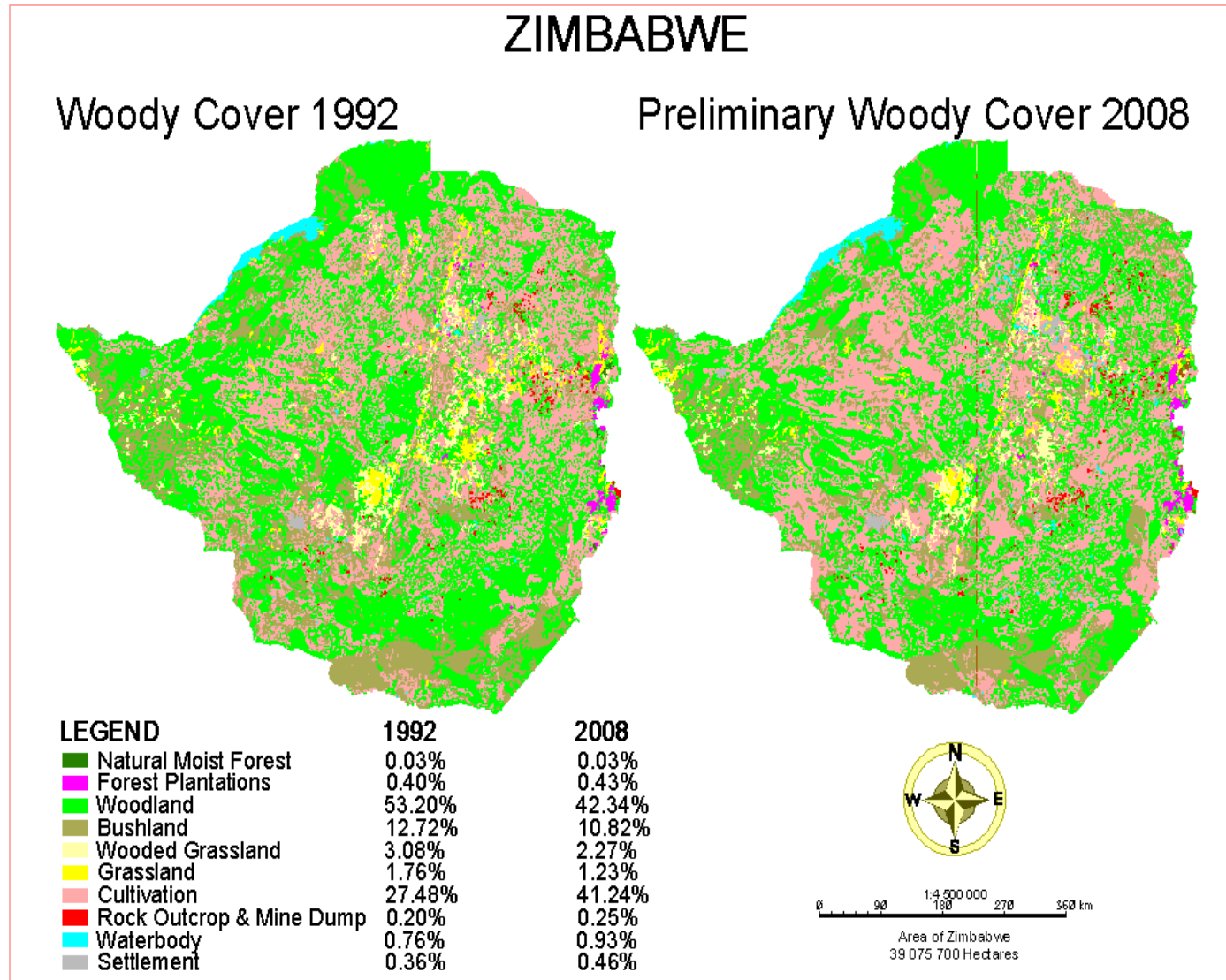
- Endemic to Ethiopia.
- Listed as endangered and Simien Mountains National Park is the only location for it.
- Although the population has been increasing over the past decade or so, the habitat continues to be degraded by human encroachment.
- 1996 – Critically Endangered
- 2008 – Endangered



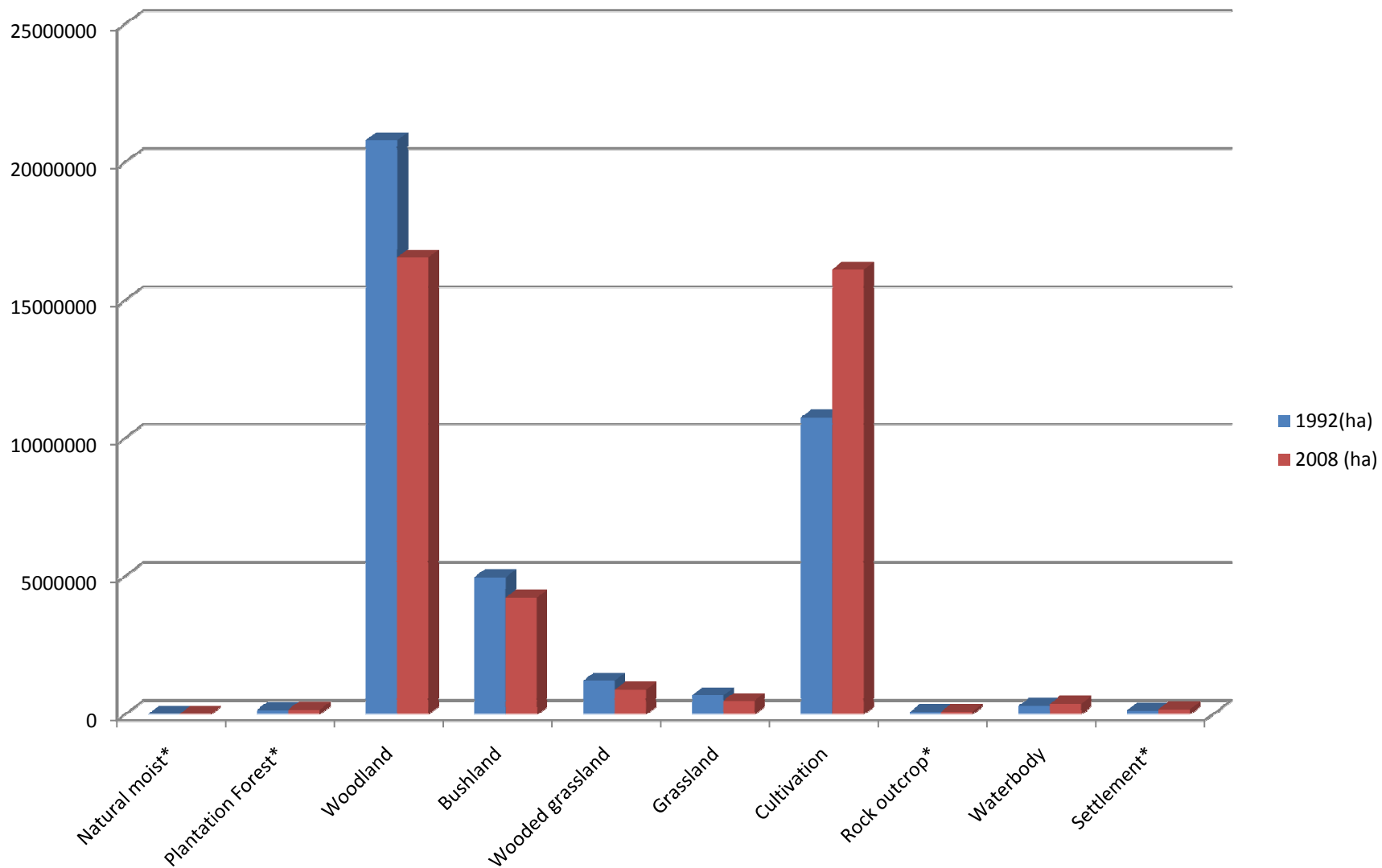
Population trend of Walia ibex in Simien Mountains National Park, Ethiopia.

Example of a biodiversity indicator #2

Deforestation and Land Use change in Zimbabwe



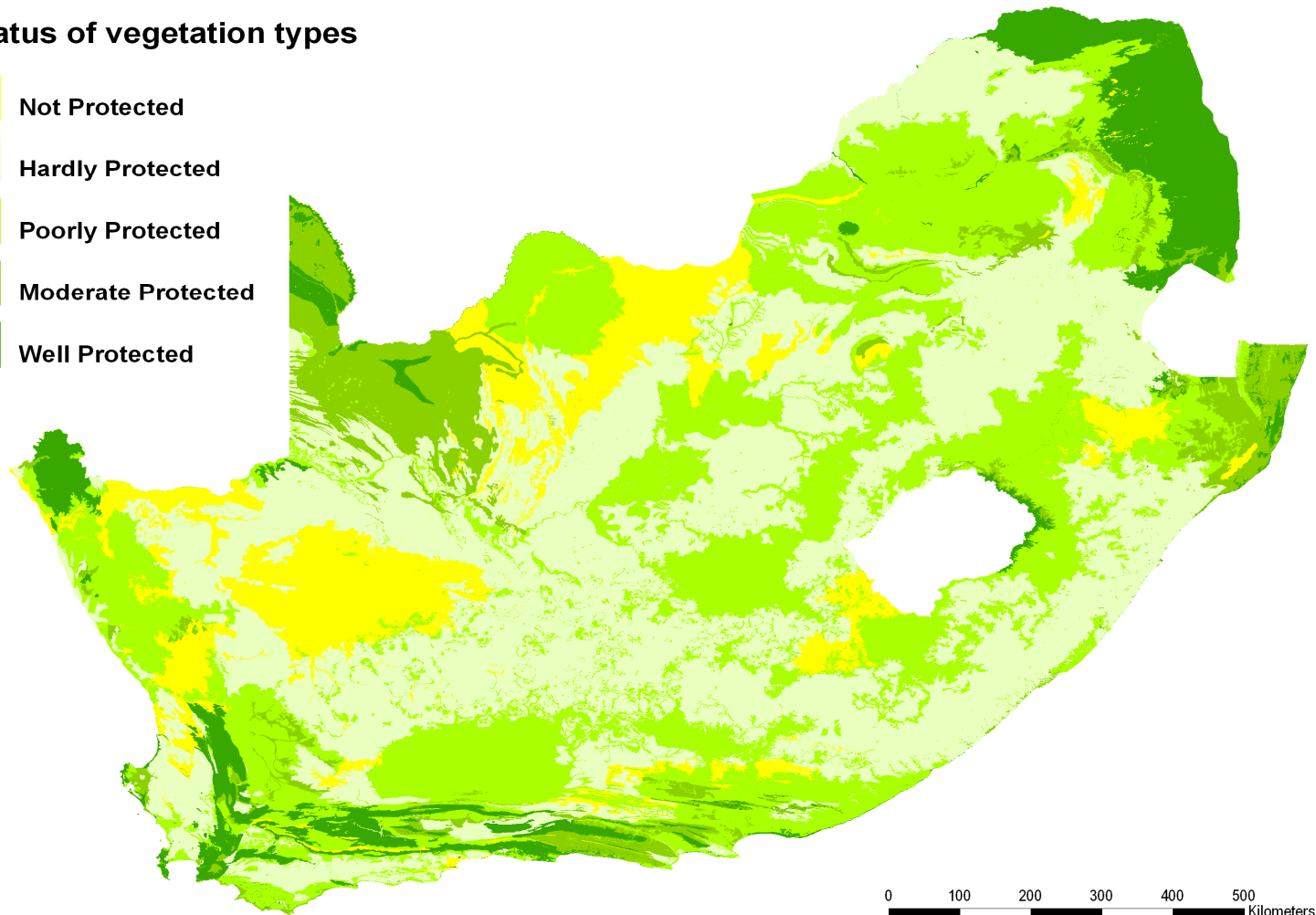
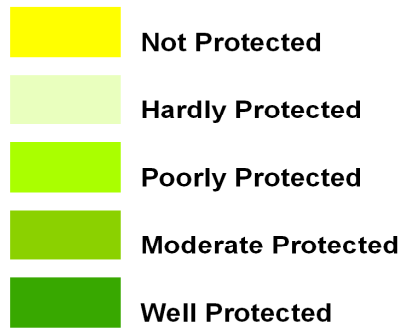
Deforestation and Land Use change in Zimbabwe



Example of a biodiversity indicator #3

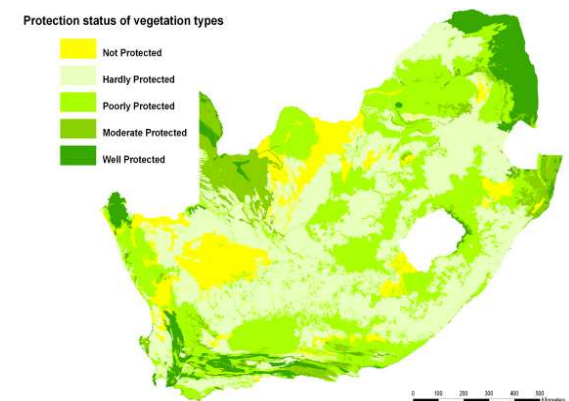
Protection status of vegetation types in South Africa in 2010

Protection status of vegetation types



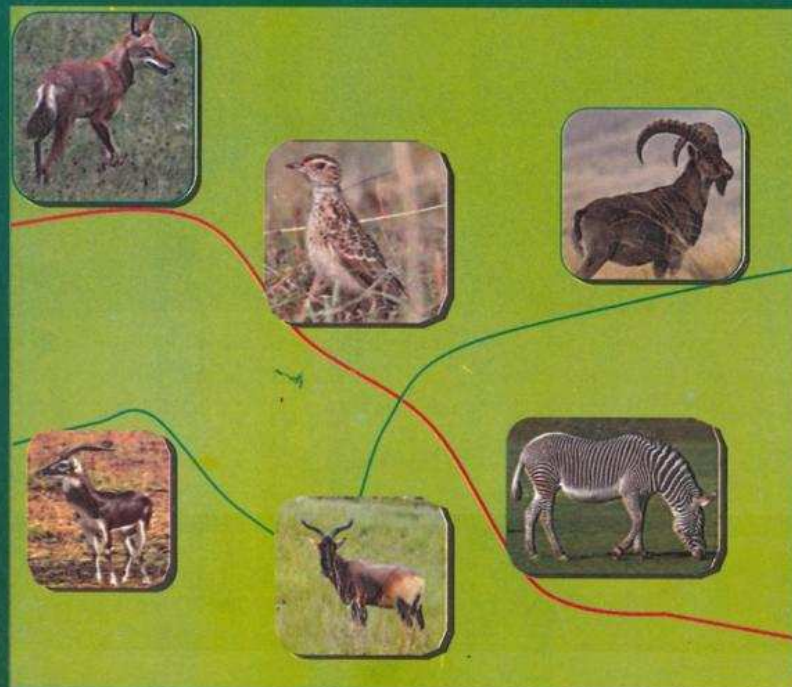
Protection status of vegetation types in South Africa in 2010 – Results of the analysis

- Of the 437 vegetation types in South Africa, 71 vegetation types are not protected and 88 are “hardly protected”.
- South Africa has an NBSAP target that by 2020 its protected areas network will cover 12% of the terrestrial environment.
- Development in 2010 of this indicator for the target found that the country had 6% of its terrestrial area under protection, which resulted in additional funding for the creation of Provincial Nature Reserves.



ETHIOPIA

Overview of Selected Biodiversity Indicators



...1970 1975 1980 1985 1990 1995 2000 2005 2010

Addis Ababa, 2010

the north.

The Simien Mountains are characterized by huge gorges and galleys, both of which carve out steep and jagged cliffs, with this species inhabiting only in the high cliffs that rise above the lower elevated plateau. However, ibex may descend to plateaus in areas where there is less human interference.



Major Threats

Walia ibex has survived two decades of war and its main threat is habitat destruction, caused by human encroachment. The remaining natural habitat is extremely limited, even though most of the villagers who lived in the lowland areas of the Park were resettled outside the Park in 1978. However, resettlers have returned once again taking advantage of the war that occurred over the last two decades or so and are residing within the National Park, creating increasing pressure on the Park and its wildlife. Today, there are over 30,000 people living within the National Park and its boundaries. Despite the existence of national and regional legislation, the remoteness of the area coupled with the existence of people living within and outside of the Park prior to its establishment as a conservation area makes legislation

difficult to enforce. Few Walia ibex also move to the south-east of their natural range to feed on cultivated crops at places where there is cultivation of barley and other crops on steep gradients. These incidences occasionally lead to conflicts between Walia and the local farmers.

Population Trend

Walia ibex is listed as endangered and it is largely confined to the Simien Mountains National Park and its surroundings. In 2004, the population stood at around 500, a slight increase over earlier estimates of 200-250 animals that were made in 1994-1996 (Fig. 3). In 2008, the population has increased to more than 700 though the species is still listed as endangered. Although the population has been showing signs of increase over the past decade or so, the habitat continues to be degraded by human encroachment.

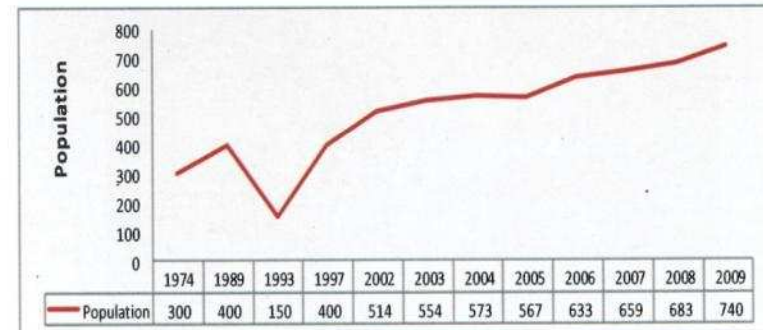


Figure 3. Population trend of Walia ibex in Simien Mountains NP

Source: IUCN and EWCA

IUCN listed the species as Endangered in 2008, 1994, 1988, 1986 and Critically Endangered in 1996.

hunting, open hunting, wildlife reserves and community conservation areas. A National Park is a reserve of natural or semi natural land, declared or owned by a government, set aside for animal safety and/ or human recreation and enjoyment, and protected from most development activities.

From the total land area coverage of the country PAs share about 15 percent only. The proportion of different categories of conservation is indicated below (Fig.11). As pointed out graphically, among the protected land area which was set aside between the year 1966 and 2010, the largest portion is covered by open hunting area which is 94,633 (about 55%) and the smallest one (1%) is the community conservation area.

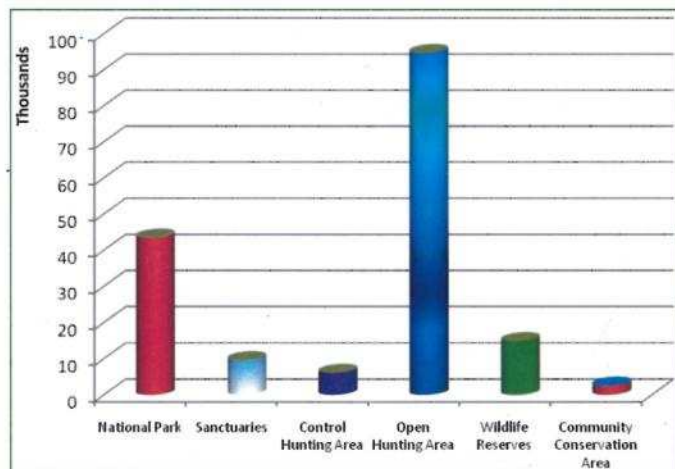


Figure 11. Protected land area (in km²) in Ethiopia
Source: EWCA and CSA

3.4 Agricultural Land Area in Rural Sedentary Private Holdings

Land plays a critical role in the production of food crops. The expansion of agriculture and intensive exploitation of land by human beings with the aspiration of increasing the volume of crop production impacts directly or indirectly on land. Changes taking place in agriculture are drastically shaping land use patterns and holding sizes.

From agricultural point of view, land is an indispensable factor for production of crops, raising of livestock and other ancillary agricultural activities. There is no universally accepted standard of land use classification. According to the FAO recommendations for the purpose of agricultural census, the total land use is categorized into six main land use types, which are land under temporary crops, land under permanent crops, grazing land, fallow land, forest or other wood land, and land for other purposes.

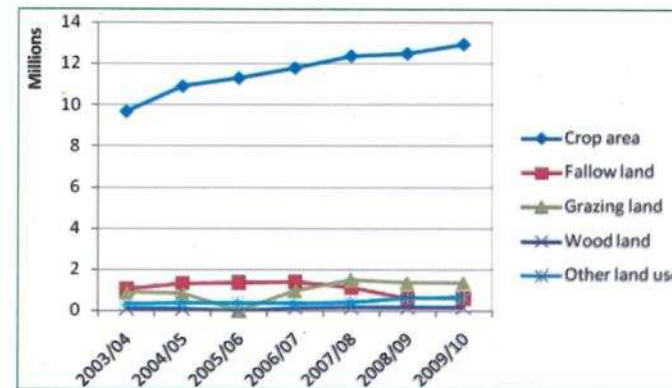


Figure 12. Land use of agricultural land (in hectare)
Source: FAO and CSA



Uses of biodiversity indicators:

- Track progress in achieving targets
- Guide policy design & implementation:
 - *Highlight where action is needed*
 - *Adaptive management*
- Build support:
 - *Communicate simple messages*



What is a successful indicator?

Scientifically valid – theory of relationship between the indicator and its purpose (what change in the indicator means) + reliability of the data

Based on available data – over time (monitoring)

Responsive to change in the issue of interest

Easily understandable – conceptually + presentation + interpretation

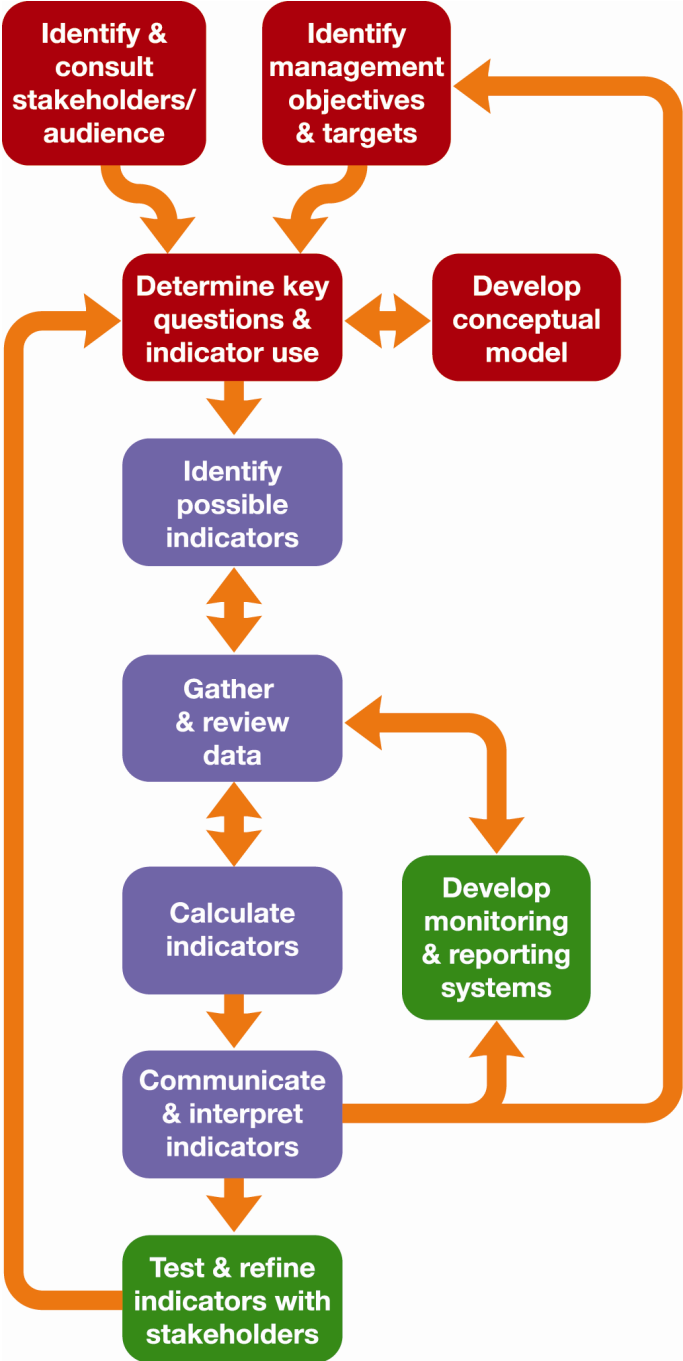
Relevant to user's needs

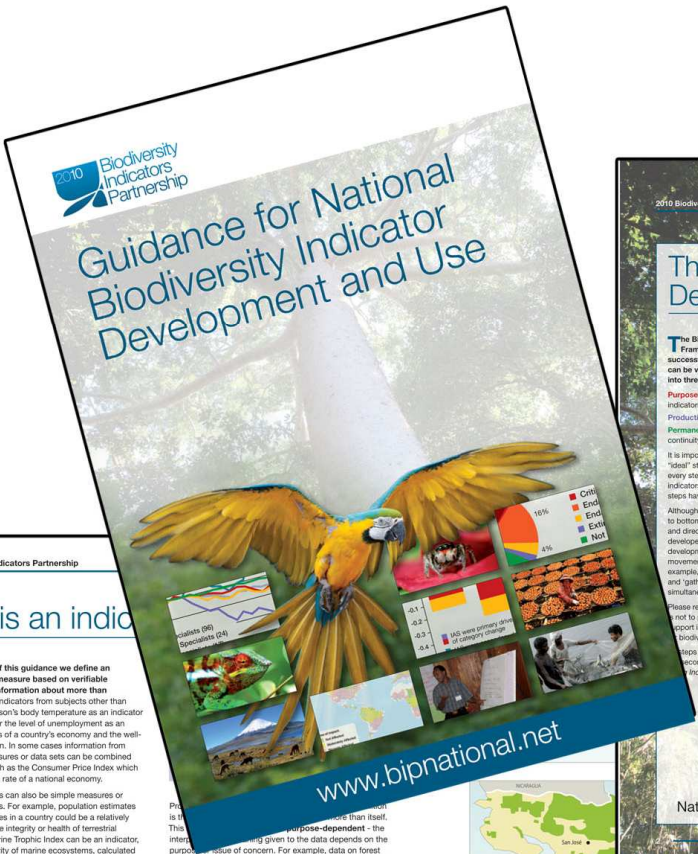
It is used!

(for measuring progress, early-warning, understanding an issue, awareness-raising, ...)

The Biodiversity Indicators Development Framework

www.bipnational.net





2010 Biodiversity Indicators Partnership

What is an indicator

For the purpose of this guidance we define an indicator as, "a measure based on verifiable data that conveys information about more than itself". Examples of indicators from subjects other than biodiversity are a person's body temperature as an indicator of his or her health, or the level of unemployment as an indicator of the status of a country's economy and the well-being of its population. In some cases information from several different measures or data sets can be combined to form an index, such as the Consumer Price Index which indicates the inflation rate of a national economy.

Biodiversity indicators can also be simple measures or more complex indices. For example, population estimates of the large cat species in a country could be a relatively simple indicator of the integrity or health of terrestrial ecosystems. The Marine Trophic Index can be an indicator, or proxy, of the integrity of marine ecosystems, calculated from data of harvested fish and their average trophic level (such as herbivores and carnivores) in the food web.

The general term 'biodiversity indicators' as used in this document and by the Convention on Biological Diversity (CBD) covers more than direct measures of biodiversity itself, such as species populations and extent of ecosystems. It also covers actions to ensure biodiversity conservation and sustainable use, such as the creation of protected areas and regulation of the harvesting of species, and pressures or threats to biodiversity such as habitat loss. Since indicators are measures of something, they can usually be presented in a numerical or quantitative form. A line graph is perhaps the most common form of presentation, but other forms such as a pie chart or map may sometimes be clearer and have greater impact.

Figure 1. Forest area estimations for Brazil, 1990 - 2010¹

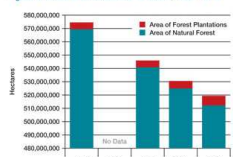


Figure 2. Costa Rica Forest Cover, 1949-2005²

It is important to note that the presentation of indicators should not be limited to graphs alone. Some indicators such as habitat extent may benefit from being presented as a series of maps (Figure 2). It may even be beneficial to present the same indicator in multiple ways to ensure adequate interpretation. For example a graph of change in forest area over time is limited to providing information on the degree to which forest habitat is being lost/gained. Although useful, the combination of this graph with forest extent maps provides insight into which areas/regions are subject to greatest forest loss/gain.

References

- ¹ FAO, 2009. Global Forest Resources Assessment 2010: Brazil Country Report. <http://www.fao.org/forestry/20082-1-206.pdf>
- ² UNEP/GRID-Arendal, 2009/ Change Forest Cover Costa Rica. UNEP/GRID-Arendal Maps and Graphics Library. <http://maps.grida.no/go/graphic/change-forest-cover-costa-rica>

2010 Biodiversity Indicators Partnership

Guidance for National Biodiversity Indicator Development and Use

The Biodiversity Indicator Development Framework

The Biodiversity Indicator Development Framework contains key steps for producing successful biodiversity indicators. The Framework can be viewed as a map to this guide and is divided into three themes:

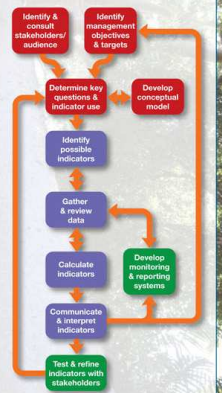
Purpose – actions needed for selecting successful indicators
Production – essential to generate indicators
Permanence – mechanisms for ensuring indicator continuity and sustainability

It is important to recognise that the framework is an "ideal" standard and it may not be necessary to cover every step. However, in our experience, successful indicators are most likely to be achieved when all the steps have been considered.

Although presented in a logical sequence from top to bottom, there are other possible starting points and directions for using the framework. Indicator developers are encouraged to think of indicator development as an iterative process, which requires movement back and forth between the steps. For example, the steps 'Identify possible indicators' and 'gather and review data' are often undertaken simultaneously.

Please remember that the purpose of the framework is not to produce indicators for their own sake, but to support informed, effective decision making and action regarding biodiversity conservation and sustainable use.

The steps in the Framework are covered in detail in second section of this guidance: Developing and Using Indicators.



For more information about the framework and national biodiversity indicator development visit the National Biodiversity Indicators Portal: www.bipnational.net

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Document development
 The guidance document is one of a series produced with the support of the 2010 Biodiversity Indicators Partnership (2010 BIP) as part of the 'national insight' component. The ideas and experience reported in this guidance have been developed and tested in capacity building workshops for national government and NGOs generated from over 25 countries in southeast Asia, the Caribbean, Central America, and eastern and southern Africa. The workshop series was supported by regional partners to UNEP-WCMC, part of the GEF-Arendal 2010 BIP. The workshops in Africa are supported by a UNEP project with funding from the UN Development Account.

Much of the thinking on biodiversity indicator development presented here was the developed through a GEF project from 2002 to 2005 called 'Biodiversity Indicators for National Law' (BINL), working with partners in Kenya, Ghana, Philippines and Ecuador and at UNEP-WCMC.

Authors
 This document has been co-authored by staff and advisors of UNEP-WCMC: Philip Buis, Ruarunde Arundel, Anna Chirney, Damon Starwell Smith, Val Kapan and Martin Arjans.

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 The authors wish to express their deep gratitude to the many participants and collaborators in the 2010 BIP and BINL projects and workshops for sharing their experience and feedback for this document. We also gratefully acknowledge the financial support of the Global Environment Facility (GEF), UNEP, European Commission and UN Development Account.

Further information
 This document is one of a series of 2010 BIP guidance materials and fact sheets to assist Parties to the Convention on Biological Diversity (CBD) to track their progress towards the 2010 Biodiversity Target and beyond. More information and examples to support national biodiversity indicator development are available from the National Biodiversity Indicators Portal: www.bipnational.net.

Please contact info@bipnational.net to send feedback, questions and suggestions for improvement of the guidance, or to find out how your regional or national work could be included in the 2010 BIP website.

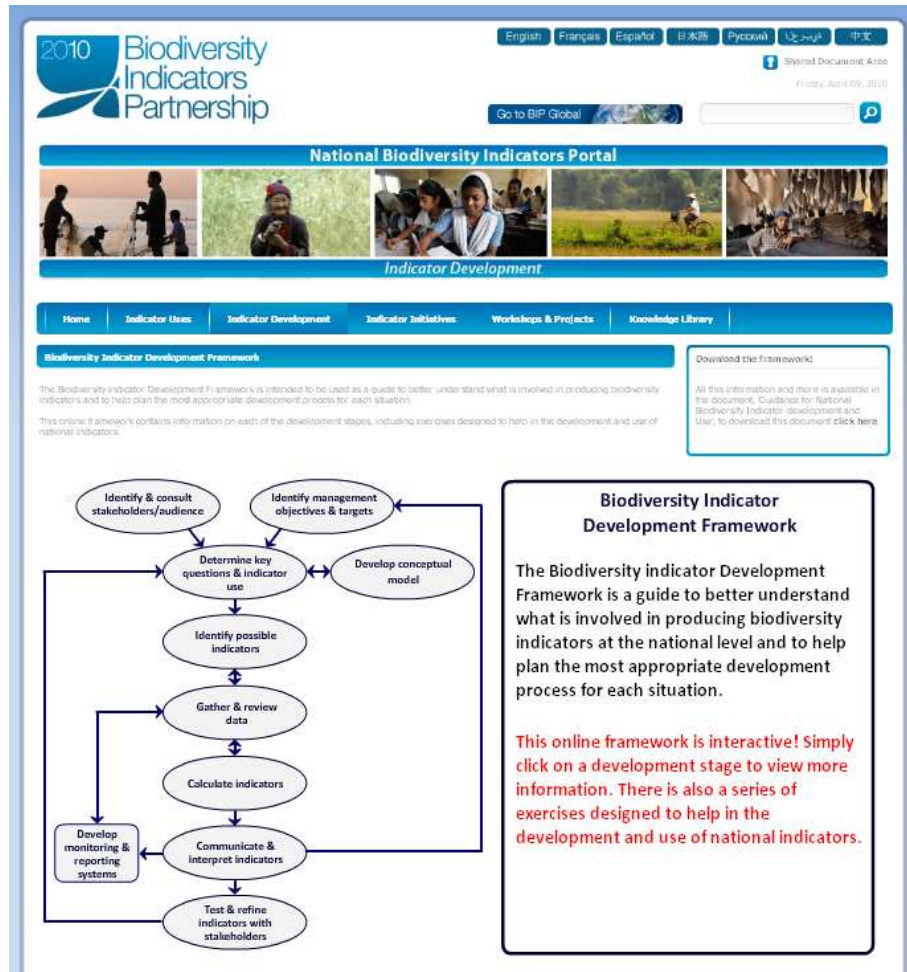
Caption: 2010 Biodiversity Indicators Partnership. 2010 Guidance for National Biodiversity Indicator Development and Use. UNEP World Conservation Monitoring Centre, Cambridge, UK. 48pp.

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 Information about the 2010 Biodiversity Indicators Partnership is available on the internet: www.bipnational.net
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www.bipnational.net



The screenshot shows the website's interface with a navigation menu and a central section titled "Indicator Development". Below this, there is a "Biodiversity Indicator Development Framework" section. It includes a flowchart and a text box describing the framework's purpose.

Biodiversity Indicator Development Framework

The Biodiversity indicator Development Framework is intended to be used as a guide to better understand what is involved in producing biodiversity indicators and to help plan the most appropriate development process for each situation. This online framework contains information on each of the development stages, including exercises designed to help in the development and use of national indicators.

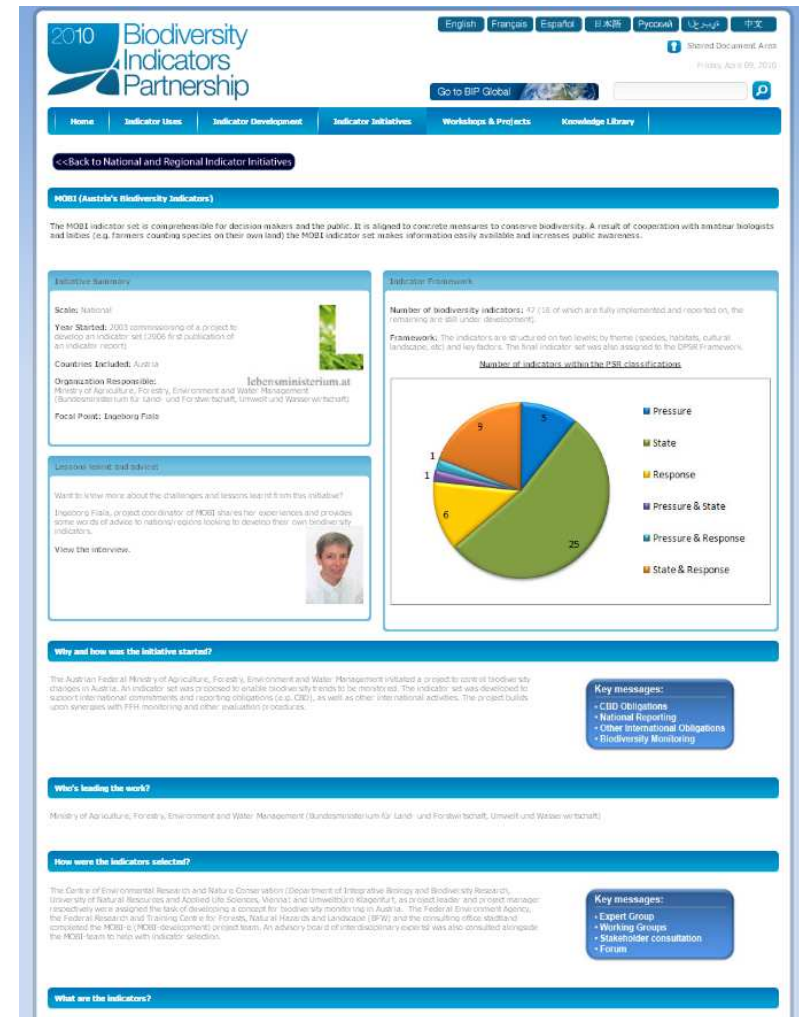
Biodiversity Indicator Development Framework

The Biodiversity indicator Development Framework is a guide to better understand what is involved in producing biodiversity indicators at the national level and to help plan the most appropriate development process for each situation.

This online framework is interactive! Simply click on a development stage to view more information. There is also a series of exercises designed to help in the development and use of national indicators.

```

    graph TD
      A([Identify & consult stakeholders/audience]) --> B([Determine key questions & indicator use])
      C([Identify management objectives & targets]) --> B
      B --> D([Develop conceptual model])
      B --> E([Identify possible indicators])
      E --> F([Gather & review data])
      F --> G([Calculate indicators])
      G --> H([Communicate & interpret indicators])
      H --> I([Test & refine indicators with stakeholders])
      I --> J([Develop monitoring & reporting systems])
      J --> B
      D --> B
      H --> B
  
```



The screenshot shows the website's interface for the MOBI (Australia's Biodiversity Indicators) page. It includes a navigation menu, a title bar, and a main content area with a pie chart and text boxes.

MOBI (Australia's Biodiversity Indicators)

The MOBI indicator set is comprehensible for decision makers and the public. It is aligned to concrete measures to conserve biodiversity. A result of cooperation with national biologists and leaders (e.g. farmers counting species on their own land) the MOBI indicator set makes information easily available and increases public awareness.

Indicator Summary

Scale: National
 Year Started: 2003 (comprising of a project to develop an indicator set (2005 first publication of an indicator report))
 Countries Included: Australia
 Organization Responsible: **Leibniz-Institut für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft**
 Ministry of Agriculture, Forestry, Environment and Water Management
 (Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft)
 Focal Point: **Legislative**

Indicator Framework

Number of biodiversity indicators: 47 (18 of which are fully implemented and reported on, the remaining are still under development)
 Framework: The indicators are structured on two levels: by theme (species, habitats, cultural landscapes, etc) and key factors. The final indicator set also applies to the DPSIR Framework.

Number of indicators within the DPSIR classification

Category	Count
Pressure	5
State	25
Response	6
Pressure & State	1
Pressure & Response	1
State & Response	1

Why and how was the initiative started?

The Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management initiated a project to create biodiversity indicators in Austria. An indicator set was proposed to enable biodiversity trends to be monitored. The indicator set was developed to support international commitments and reporting obligations (e.g. CBD), as well as other international activities. The project builds upon previous work with FPM monitoring and other evaluation procedures.

Key messages:

- CBD Obligations
- National Reporting
- Other International Obligations
- Biodiversity Monitoring

Who's leading the work?

Ministry of Agriculture, Forestry, Environment and Water Management (Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft)

How were the indicators selected?

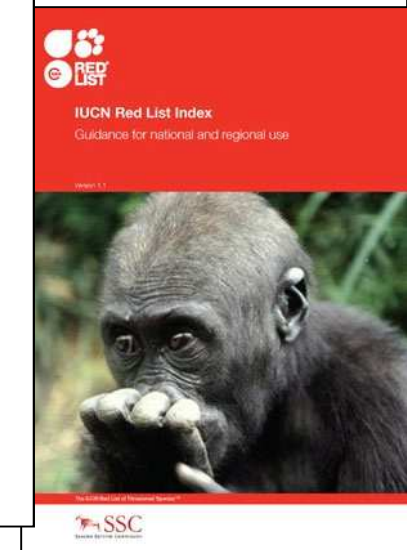
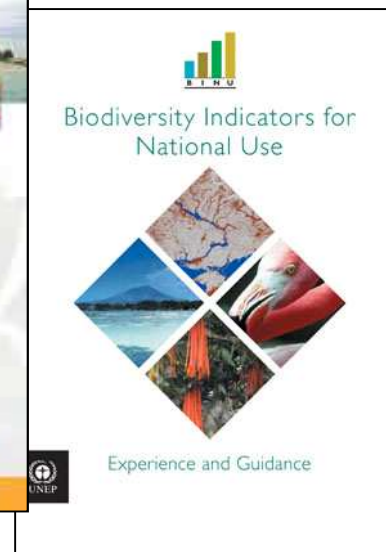
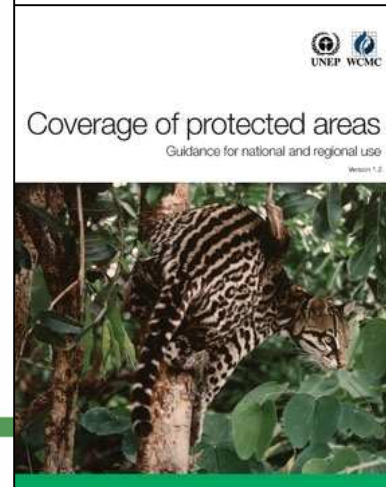
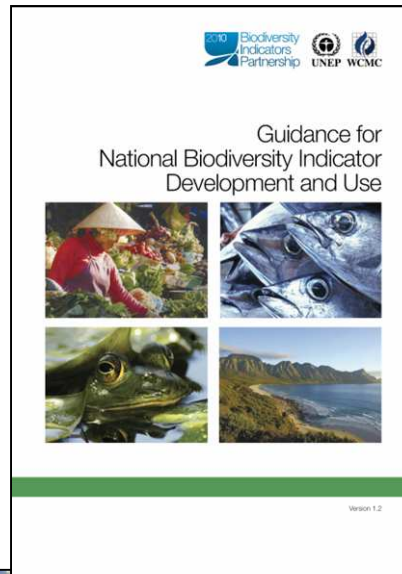
The Centre of Environmental Research and Nature Conservation (Department of Integrative Biology and Biodiversity Research, University of Natural Resources and Applied Life Sciences, Vienna) and Umweltbüro Kogonfurt, as project leader and project manager respectively were assigned the task of developing a concept for biodiversity monitoring in Austria. The Federal Government Agency, the Federal Agency for Nature Conservation (BfN) and the consulting office, the Federal Agency for Nature Conservation (BfN) and the consulting office, the Federal Agency for Nature Conservation (BfN) completed the MOBI (MOBI development) project team. An advisory board of interdisciplinary experts was also consulted alongside the MOBI team to help with indicator selection.

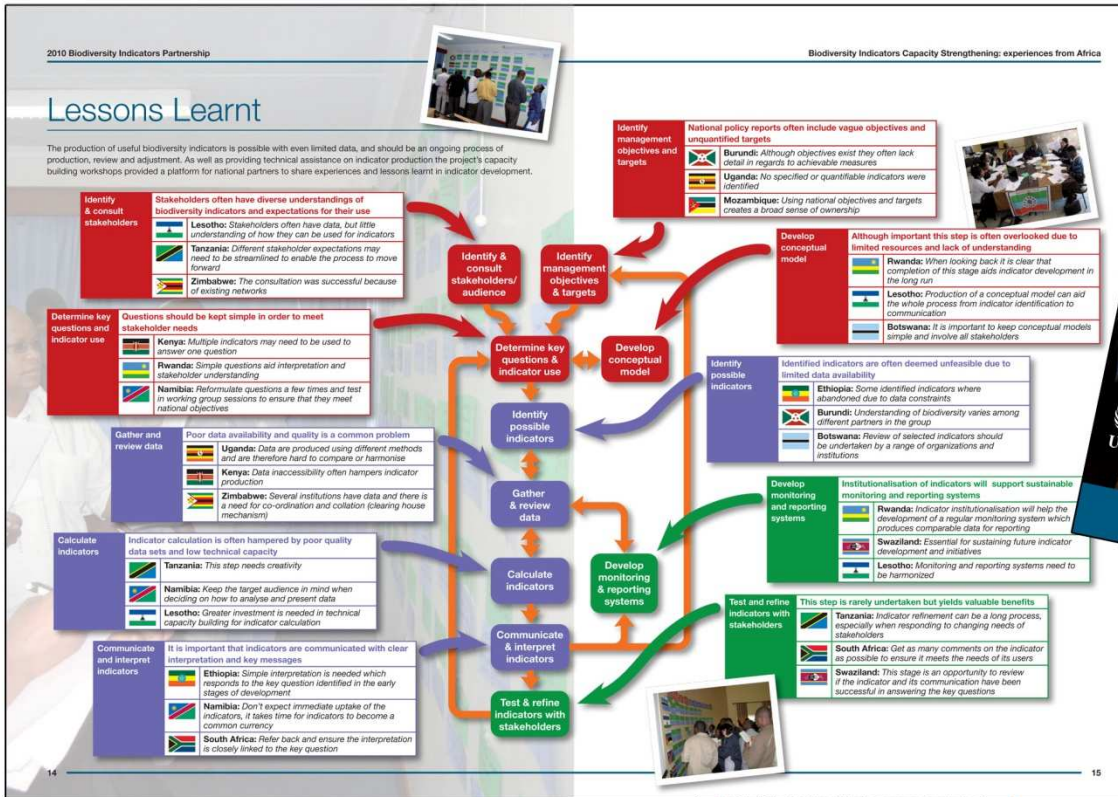
Key messages:

- Expert Group
- Working Groups
- Stakeholder consultation
- Forum

What are the indicators?

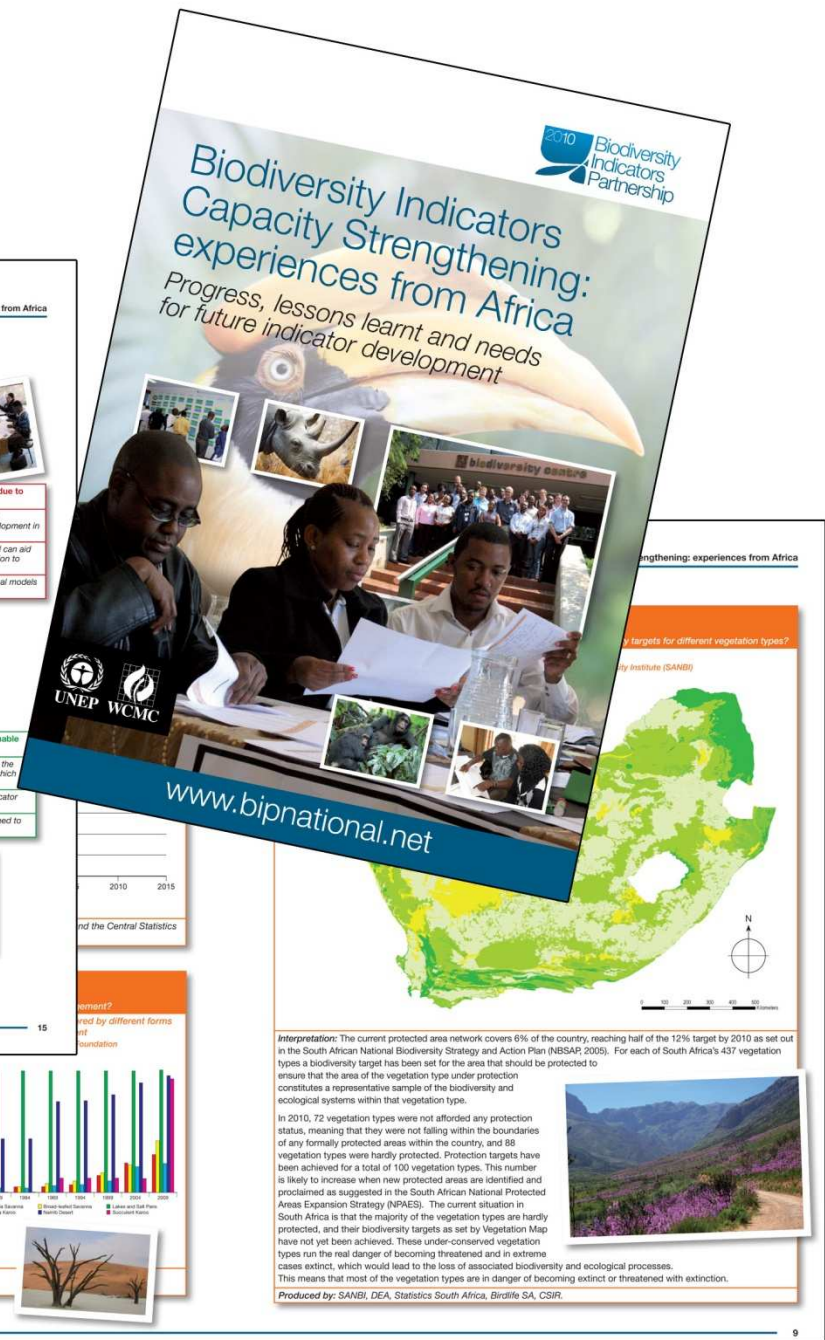
- Indicator Guidance and factsheets
- Useful literature
- Indicator resources





Biodiversity Indicators Capacity Strengthening: experiences from Africa

Progress, lessons learnt and needs for future indicator development



2010 Biodiversity Indicators Partnership

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Interpretation: The current protected area network covers 6% of the country, reaching half of the 12% target by 2010 as set out in the South African National Biodiversity Strategy and Action Plan (NBSAP, 2005). For each of South Africa's 437 vegetation types a biodiversity target has been set for the area that should be protected to ensure that the area of the vegetation type under protection constitutes a representative sample of the biodiversity and ecological systems within that vegetation type.

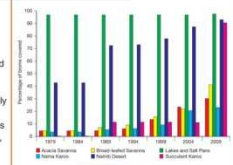
In 2010, 72 vegetation types were not afforded any protection status, meaning that they were not falling within the boundaries of any formally protected areas within the country, and 88 vegetation types were hardly protected. Protection targets have been achieved for a total of 100 vegetation types. This number is likely to increase when new protected areas are identified and proclaimed as suggested in the South African National Protected Areas Expansion Strategy (NPAES). The current situation in South Africa is that the majority of the vegetation types are hardly protected, and their biodiversity targets as set by Vegetation Map have not yet been achieved. These under-protected vegetation types run the real danger of becoming threatened and in extreme cases extinct, which would lead to the loss of associated biodiversity and ecological processes. This means that most of the vegetation types are in danger of becoming extinct or threatened with extinction.

Produced by: SANBI, DEA, Statistics South Africa, BirdLife SA, CSIR.

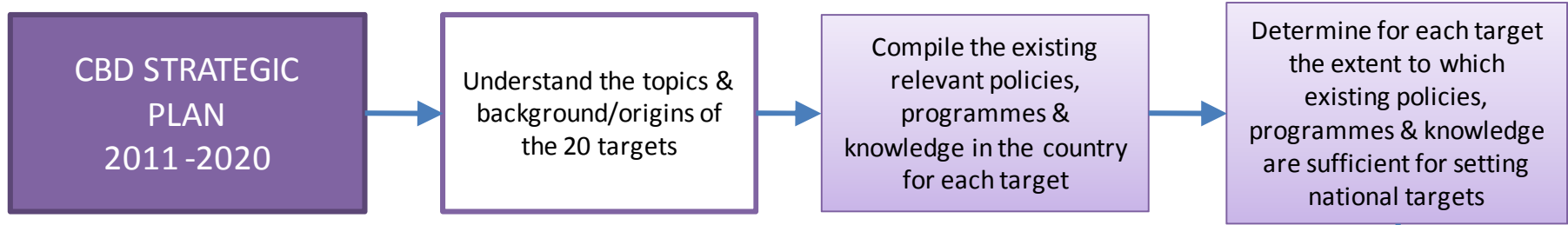
and Namib-Naukluft National Parks. The more recent registration of Communal Conservancies and establishment of Private Protected Areas. The Succulent Karoo biome coverage has increased to 91%, mainly due to the proclamation of the 2.5 million hectares Spengriet National Park in 2008. The Broad-leaved Savanna coverage has increased to 41% as a result of the proclamation of four State Protected Areas in the Kavango and Caprivi, and the registration of some 15 Communal Conservancies in the same regions. The Acacia Savanna biome now has 30% of its area under conservation management, mainly due to the establishment of Freehold Conservancies, but less than 5% is in the State Protected Area network. The least well protected biome is the Nama Karoo with 23% of its area under some form of conservation, but only 5% in the State Protected Area network. Communal Conservancies protect almost 15% of this biome.

The importance of different forms of landscape and biodiversity conservation in Namibia is apparent when their contributors are seen in terms of biome protection.

Produced by: Dr Chris Brown, Namibia Institute for Sustainable Development, for the 'State of Biodiversity in Namibia' report, 2010.

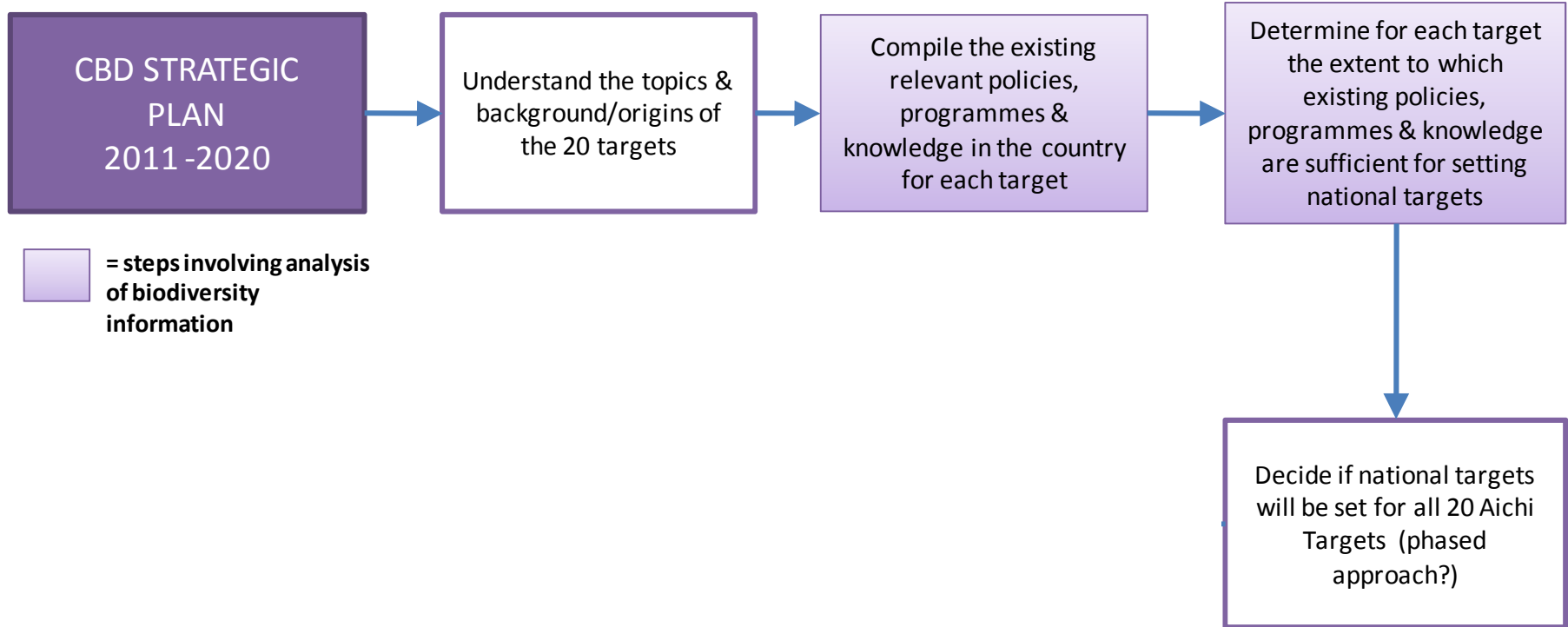


Possible steps in updating NBSAPs with the Aichi Targets

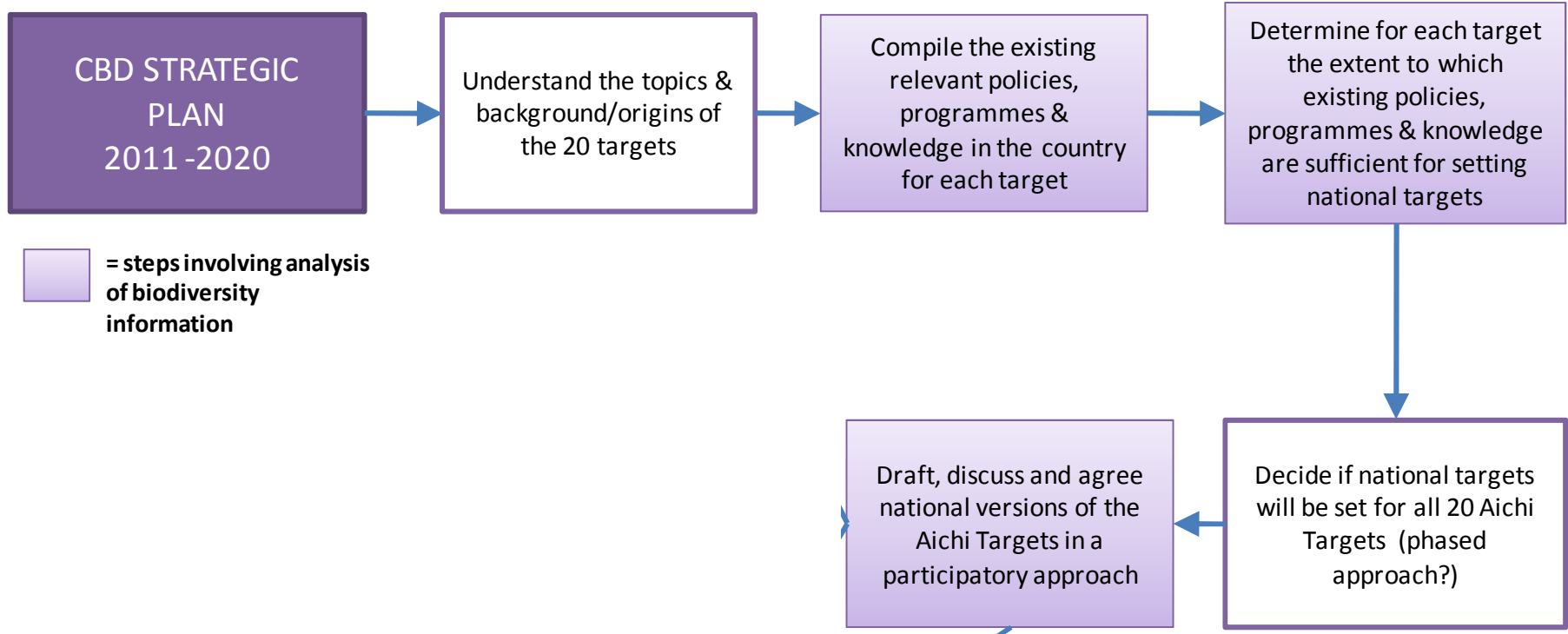


 = steps involving analysis of biodiversity information

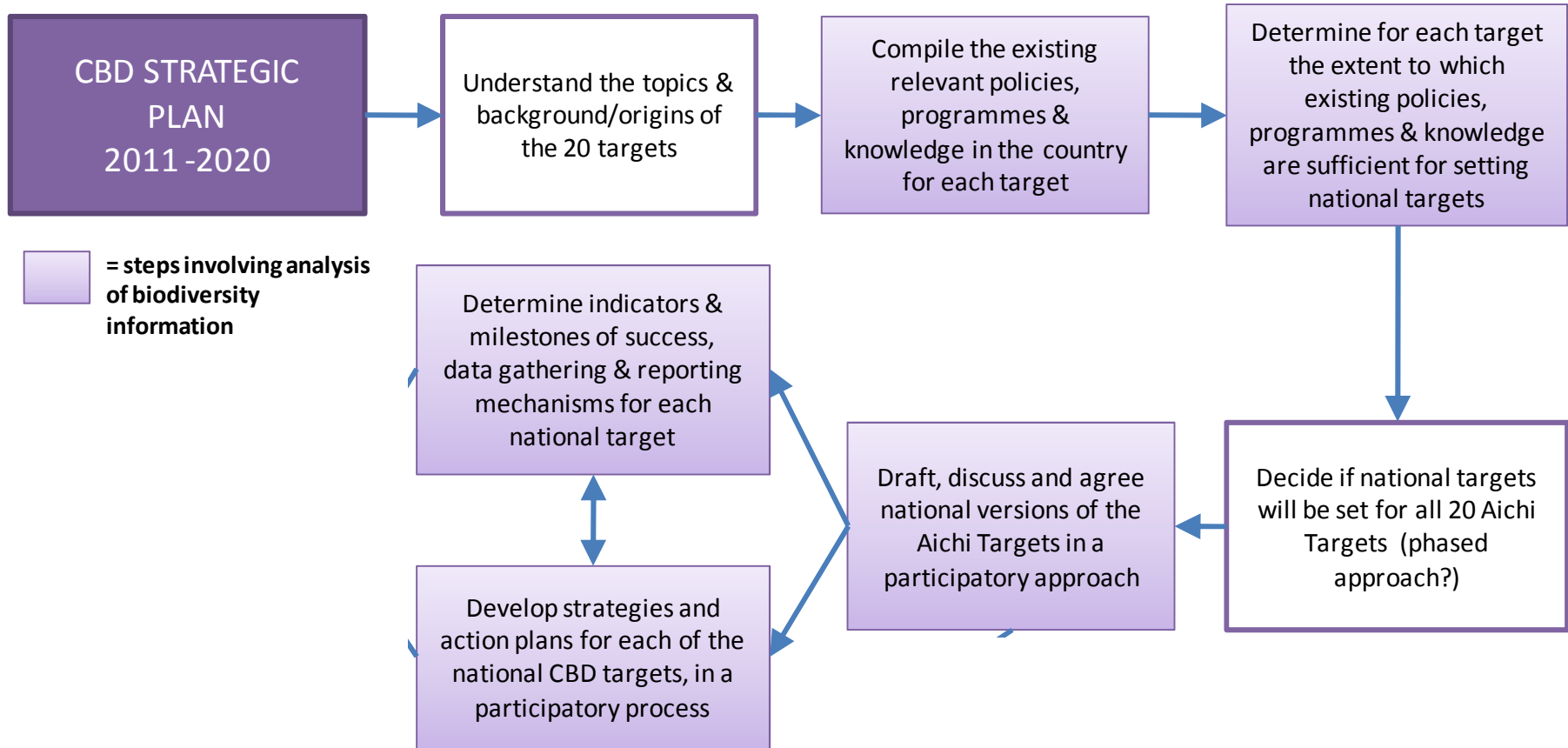
Possible steps in updating NBSAPs with the Aichi Targets



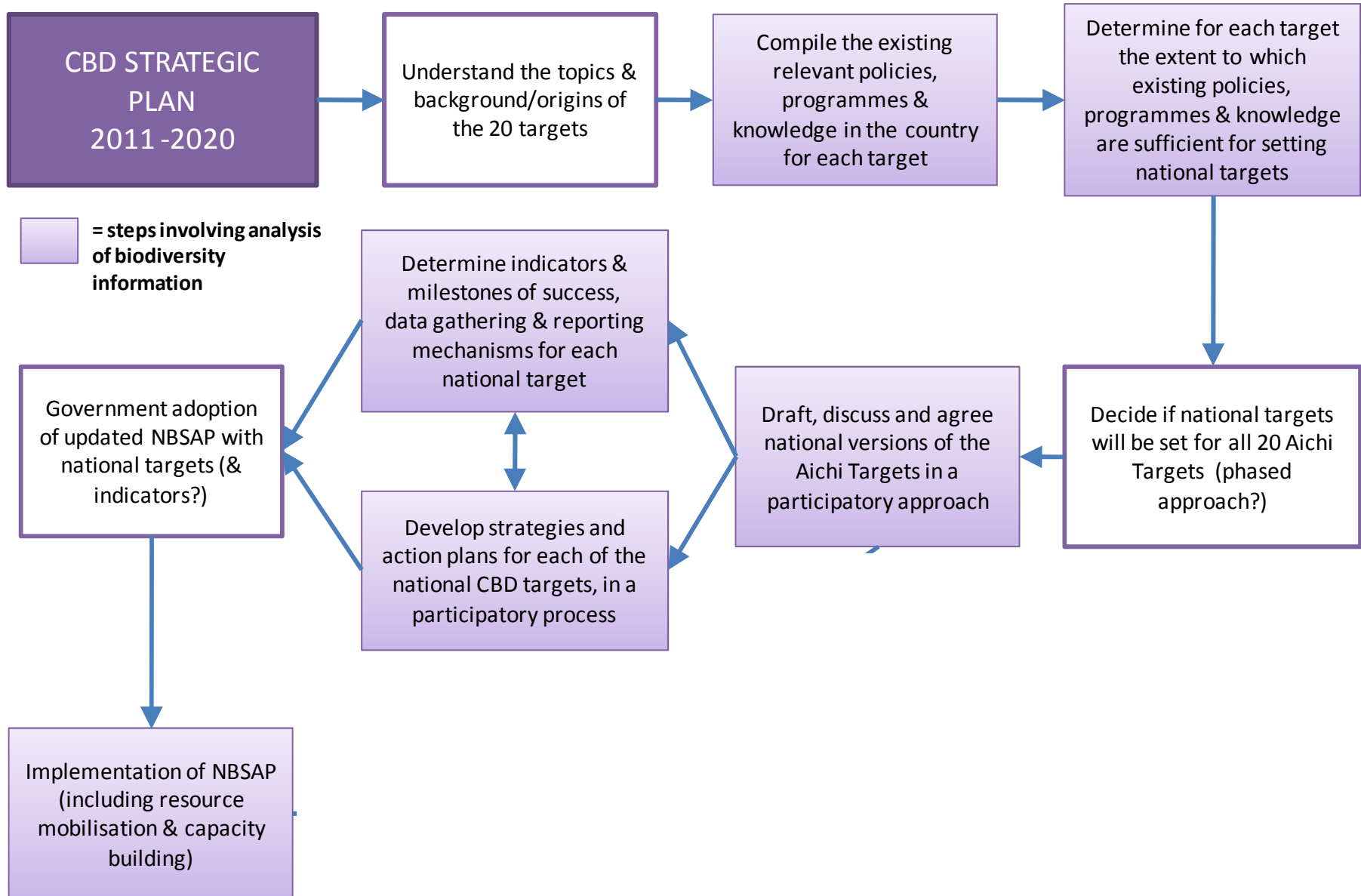
Possible steps in updating NBSAPs with the Aichi Targets



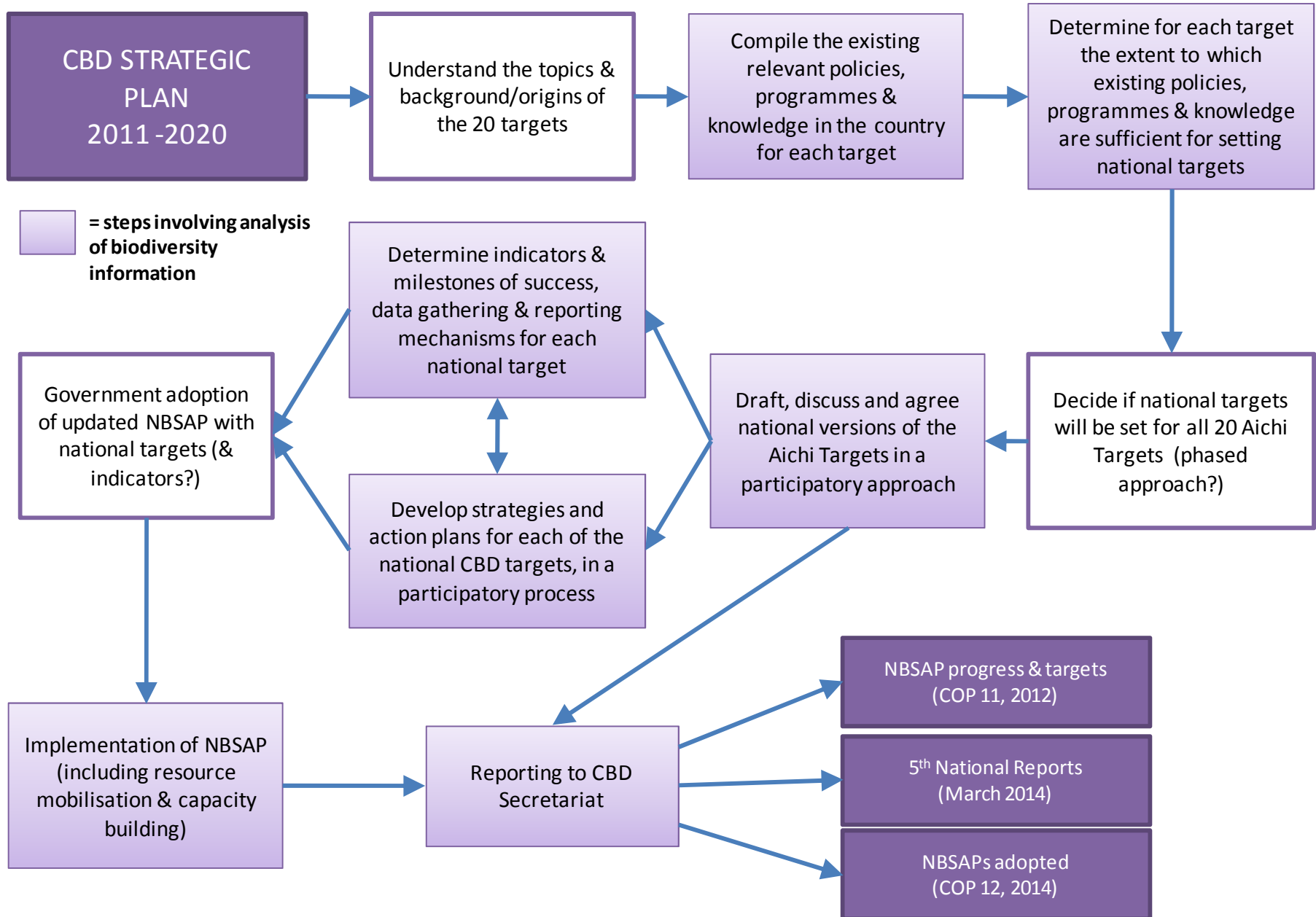
Possible steps in updating NBSAPs with the Aichi Targets



Possible steps in updating NBSAPs with the Aichi Targets



Possible steps in updating NBSAPs with the Aichi Targets





Biodiversity Indicators Partnership (BIP)

Formed in 2007, its primary focus was to report on the global progress towards achieving the 2010 Biodiversity Target.

UNEP-WCMC is the Secretariat.

Following CoP-10, the BIP is developing four components:

- Development and use of global, regional and national biodiversity indicators
- Capacity building and learning for biodiversity indicators
- Mainstreaming biodiversity indicators into other sectors
- www.bipindicators.net* – the website for information resources and e-learning on biodiversity (and related) indicators

Indicators for the Strategic Plan for Biodiversity 2011-2020

Ad-Hoc Technical Expert Group (AHTEG) on indicators for the Strategic Plan - June 2011:

- **Recommend development of the global indicator suite;**
- **Develop guidance and propose options to support Parties in their development of indicators, monitoring, reporting and setting of targets;**
- **Advise on strengthening the linkages between global and national indicator development and reporting.**

IPBES – Intergovernmental Platform on Biodiversity and Ecosystem Services



Some final messages

- **Having an inspiring and clear target is more important than the right indicators.**
- **There are data limitations, but a lot is possible with existing data – demonstrate the benefits of investing in biodiversity indicators, monitoring and reporting.**
- **Have a national post, committee or institution responsible for the gathering, analysis and communication of biodiversity information.**



Thank you

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Obstacles to successful indicator development and use

- **Lack of resources – funding, expertise, data.**
- **Insufficient stakeholder/audience consultation.**
- **Project-based (i.e., unsustained) data collection and/or management.**
- **Data may not be appropriate for indicator purpose, therefore possibly not sufficiently sensitive to change.**
- **Part of a wider process of policy/strategy development and target setting - can be an after-thought and therefore indicator suite possibly not appropriately designed.**