

# Towards a political biodiversity governance indicator for biomass-based economic activities in Belgium

## Report on the framing of future research on the development of the indicator

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# 1 Introduction

## 1.1 Context of the project

The Belgian Federal Public Service (FPS) of Health has launched a project aiming at developing an information, awareness and decision support tool for companies, that facilitates sourcing of terrestrial organic raw materials (such as wheat, tomatoes, bananas,...) with minimal negative impacts on biodiversity. In order to do that, the tool will provide information about the impacts on biodiversity of terrestrial organic raw material production. The focus of the project is on the production side of these raw material inputs biomass-based economic activities. In that context, the FPS is developing a methodology based on three indicators: (1) the state of biodiversity, (2) the impact of farming practices and forestry practices and (3) political governance in the field of biodiversity.

This set of three indicators fits into the DPSIR logic used to describe the relations between the causes and consequences of environmental issues. The pressure indicator is represented by the impact of farming practices; the state indicator is the state of biodiversity and the response indicator is the political governance as it shows how society responds and takes political action to mitigate, eliminate or prevent pressures and impacts, reflecting the efforts made by countries for a sustainable use of biodiversity resources.

Initiators and clients of biomass related economic activities are the target group. Biomass related activities are defined as any productive activities that use organic resources as raw materials. The tool will eventually be put online as a supporting tool for developing biomass related economic activities. Companies will be invited to enter data and the system will provide them with a detailed analysis of the impact of their procurement policy on biodiversity.

This research note applies to the development of a political governance indicator. The aim of this short report is to provide some indications on how to frame future research on the development of the governance indicator.

## 1.2 Status of the report

This research note summarizes the discussions with selected key experts from academia, public administrations and private sector (for profit and not-for profit) on the development of the political governance indicator for assessing the impact of biomass-based economic activities on biodiversity. It is the result of three preliminary research notes written by Tom Dedeurwaerdere, which were discussed with the experts and the accompanying committee of the project and amended by the author based on these discussions:

- (1) Note and meeting on the “Analysis of the indicators Tom Dedeurwaerdere (UCL), Pierre Biot (FOD VVVL), Sabine Wallens (FOD VVVL) et Eline Botte (FOD VVVL), Hendrik Segers (KBIN), Charles-Hubert Born (UCL)
- (2) Note and meeting on the “Combination of the indicators”: Tom Dedeurwaerdere (UCL), Patricia Delbaere (Bureau Fédéral du Plan), Pierre Biot (FOD VVVL), Sabine Wallens (FOD VVVL) et Eline Botte (FOD VVVL). Comments by email: Hendrik Segers (KBIN), Charles-Hubert Born (UCL)
- (3) Note and meeting on the “Use of the indicators”: Tom Dedeurwaerdere (UCL), Patricia Delbaere (Bureau Fédéral du Plan), Pierre Biot (FOD VVVL), Sabine Wallens (FOD VVVL), Eline Botte (FOD VVVL), Hendrik Segers (KBIN), Johannes Schnack (private sector), Marielle Smeets (FOD VVVL), Stéphanie Baclin (FOD VVVL). Comments by email: Ines Verleye (FOD VVVL).

### 1.3 Limitations of the report

The objective of the report is to present, in a systematic and reliable manner, the main arguments and data sources to be considered in the elaboration of the information, awareness and decision support tool. To be as concrete as possible, some preliminary calculations and comparative tables are also presented in the report. However, at this stage these should be considered as entirely illustrative. Any dissemination of these preliminary results beyond this report should be based on a separate follow-up study that completes and further crosschecks these calculations. Such a follow-up study might be focused on easy to replicate methods to calculate the summary tables, ideally through automated web-based software that allows automatic verification, direct linking to the source data in a dynamic manner (to take into account evolutions) and presenting the results in a visually attractive format.

## 2 General principles

### 2.1 Concept of biodiversity in the Convention on Biological Diversity

The development of the information, awareness and decision support tool for biomass-based activities aims to supporting the implementation of biodiversity related policies. Biodiversity decline is a major concern of the international policy community and citizens across the world. This concern is at the core of the Convention on Biological Diversity adopted at the Earth Summit in Rio de Janeiro, in 1992. In line with the international debates amongst experts, policy officials and civil society associations, the parties to the Convention decided that the ecosystem approach should be the primary framework of action to be taken under the Convention (COP2, decision II/8, paragraph 1). This understanding was further elaboration in a set of operational principles that were adopted at the fifth meeting of the Conference of the Parties (Nairobi, Kenya, 15-26 May 2000). This report proposes to use the ecosystem management approach as identified by the CBD (COPV/6). The application of the ecosystem approach helps to reach a balance between the three objectives of the Convention: conservation; sustainable use; and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

The specific focus of this report is on the production side of land-based biomass as input to biomass-based economic activities. In this context, two of the 12 principles of Decision V/6 on the ecosystem approach are especially relevant for this report:

Principle 1 of Decision V/6: *The objectives of management of land, water and living resources are a matter of societal choice.*

Rationale: Different sectors of society view ecosystems in terms of their own economic, cultural and societal needs. Indigenous peoples and other local communities living on the land are important stakeholders and their rights and interests should be recognized. Both cultural and biological diversity are central components of the ecosystem approach, and management should take this into account. Societal choices should be expressed as clearly as possible. Ecosystems should be managed for their intrinsic values and for the tangible or intangible benefits for humans, in a fair and equitable way.

principle 4 of Decision V/6: *Recognizing potential gains from management, there is usually a need to understand and manage the ecosystem in an economic context. Any such ecosystem-management programme should:*

- (a) Reduce those market distortions that adversely affect biological diversity;*
- (b) Align incentives to promote biodiversity conservation and sustainable use;*
- (c) Internalize costs and benefits in the given ecosystem to the extent feasible.*

Rationale: The greatest threat to biological diversity lies in its replacement by alternative systems of land use. This often arises through market distortions, which undervalue natural systems and populations and provide perverse incentives and subsidies to favour the conversion of land to less diverse systems. Often those who benefit from conservation do not pay the costs associated with conservation and, similarly, those who generate environmental costs (e.g. pollution) escape responsibility. Alignment of incentives allows those who control the resource to benefit and ensures that those who generate environmental costs will pay.

In line with the approach within the Convention on Biological Diversity, integrated management of ecosystem processes and functions is also the basic framework used by the intergovernmental science-

policy platform IPBES (Intergovernmental Platform on Biodiversity and Ecosystem Services), as presented for instance in detail in the 2014 Decision IPBES 2/4  
(On line at : [http://www.ipbes.net/sites/default/files/downloads/Decision%20IPBES\\_2\\_4.pdf](http://www.ipbes.net/sites/default/files/downloads/Decision%20IPBES_2_4.pdf))

## 2.2 Quality of the indicators and unit of analysis

The indicators that will be developed under this project are a first step to better target biomass-based economic activities and to raise awareness on the impact of these activities on biodiversity within different national countries' policy contexts. To accomplish this goal, the text of the Federal Public Service circumscribes clearly the type of indicator that needs to be developed.

**First**, as related to the geographical scale, the policy governance indicator should allow to assess the political governance of countries in the field of biodiversity as objectively as possible, in order to support countries that focus their efforts on preserving biodiversity (sustainable use, conservation, etc.). It must also be used to benchmark several countries. Therefore, **the unit of analysis defined by the project is the country's governance profile as a whole** (as it relates to its biodiversity policy, understood as adaptive ecosystems management of coupled social-ecological systems. )

**Second**, in relation to the quality of the indicators, the project specifies that the indicators should (amongst others):

- be easily and regularly updated; **data must be available** about and for long and regular periods of time, and must not rely on surveys carried out only every ten years, etc.;
- provide a result that is simple, clear and **easy to understand**. We do not want any indicator which includes numerous parameters making the result difficult or too complicated to understand;

Based on these premises, we propose to use the following methodological principles in the choice of the components of the indicator:

- (1) A key stumbling block in the construction of high quality indicators at the country level is the lack of original survey data on the specific issues covered in this report. To overcome this, some indicators (for instance on corruption) are built on "proxies" (measuring one feature through another, based on the assumption that both features are correlated) and on re-combination of secondary data (data gathered through surveys dedicated to other topics). As a result, **many indicators are built on loose grounds**, with extremely poor reliability and data quality. To overcome **this, preference should be given to indicators based on original survey data related to the specific issues as far as possible**.
- (2) There is also a substantial difference between measuring a thing and measuring perceptions of it. In the context of governance, for example, perceptions of crime risk have been shown to be quite different than actual crime levels; perceptions of corruption have been shown to differ from actual corruption levels; and trust in government has been shown to differ from administrative performance (references provided in Thomas, 2010, p. 36). To overcome this bias, **preference should be given to indicators that measure underlying phenomena, and related real-world events and actions, rather than perceptions of the phenomena**. For example, observed instances of bribery are a more reliable basis for constructing an indicator than perceptions of corruption.

## 2.3 Information needed for long term decision making on the use of biomass

A third general consideration for the choice of appropriate indicators is related to the temporal scale. Indeed, the information tools should be able to provide sufficient information for integrating a long-term perspective in the decisions on the development of biomass-related economic activities. Even

though the role of the indicators is not to take a stance on the detailed pathways chosen in such a long-term perspective, they should nevertheless provide the minimum information needed for decision makers (policy or investors) to enable them to adopt such a long-term perspective in a meaningful manner.

In the context of this information gathering exercise, it is useful to consider both primary production of biomass and biomass based activities that are using waste products of other activities (recognizing that in some cases the borderline between these two is not so clear/can be evolving):

- Primary production of biomass
  - For example, maize crops used for ethanol production (
  - For example, use of cotton or hemp to make textile fibres
  - For example, the direct use of wood for the paper industry
  - For example, the Indian government has allocated 40million ha of land to grow *Jatropha curcas* (a plant with seeds containing 27-40% oil)
  - For example, the use of palmoil
- Biomass based activities that are using waste products of other activities (such as residues from wood processing industries)
  - For example Sweden has an important biomass industry based on secondary wood products

For assessing biomass related economic activities, two major trade-offs need to be carefully considered by each decision maker. First, the trade-off between use of cropland for food and feed production, as compared to its use for industrial biomass crops. Second, its use for nature conservation purposes or sustainable use of biodiversity as compared to its use for biomass on monoculture crop land for instance. As a general principle, decision makers should be able to check that long-term objectives of food security and nature conservation/sustainable use of biodiversity are not jeopardized by biomass-based investment. Information on the countries' efforts on food security, nature conservation and sustainable use are therefore crucial in any investment decision for primary biomass production.

A specific concern that is interrelated with these two trade-offs is the case of forest management. Biomass based activities might have both a direct and an indirect impact on forest management. First, forest biomass is used directly in some biomass activities such as biofuel production. Second, indirectly, biomass based activities might lead to pressure to convert additional forested land into cropland. Such conversion has a negative impact both on biodiversity and carbon sequestration. Therefore any biomass investment project should not only be directed to already available non-forested land with low biodiversity value, but also careful assess its indirect impact on the overall available land for biodiversity conservation and sustainable use of biodiversity.

For biomass activities on the use of waste products (such as feedstocks residues), transparent and effective regulatory frameworks will be crucial in order to monitor the origin of the products and to distinguish these secondary waste products from primary production of biomass.

### 3 Analysis of biodiversity policy indicators

Based on the premises above, a broad set of governance indicators is required to reflect the social, economic and environmental dimensions of land use choices that are consistent with the ecosystem approach.

An appropriate starting point for the selection of such as set of indicators is the seven-principle code of conduct for investors in biomass and second-generation biofuels proposed by the World Bank (Jansen, 2012). This code of conduct was developed in reaction to mounting criticism on global farmland grab by overseas investors.

According to the World Bank the following seven principles should be respected in any biomass/biofuel investment:

- 1) Respecting local land rights
- 2) Ensuring food security
- 3) Ensuring transparency and good governance
- 4) Consultations with those involved
- 5) Responsible agro-investing
- 6) Social sustainability
- 7) Environmental sustainability

As such these 7 principles directly can contribute to the core objectives of the Convention on Biological Diversity as discussed above. Amongst other elements, they can incorporate biodiversity related indicators (under ensuring food security, social sustainability and environmental sustainability), the work under CBD's art 8(j) on indigenous people and local communities, and the social and political dimensions of adaptive ecosystems management. Not all the 7 principles are defined at country level however. In particular, the principle 4 is specific to the relationship between the investor and the host country and needs to be analysed at that level (that is it is a bilateral feature related to the separate agreements and not to country level governance principles).

As stated above, to keep the data treatment and gathering both realistic and of good quality, a focus on a limited set of sub-indicators is needed. We can operationalize the 6 remaining principles in terms of the major points of concern highlighted above in the section on general principles (in particular as related to the main trade-offs in land use choice and general governance features):

- 1) Respecting local land rights: part of this feature is a specific requirement to be fulfilled in each separate agreement ; the general part can be covered in principle 5
- 2) Ensuring food security: indicator for **food security** policies in the country
- 3) Ensuring transparency and good governance: indicator for **control and monitoring of corruption**
- 4) Social sustainability : part of this features is a specific requirement to be fulfilled in each separate agreements ; the general part can be covered in principle 5
- 5) Responsible agro-investing: indicator for overall **respect of the rule of law** in the country, in particular as pertaining to the respect of property rights and environmental laws
- 6) Environmental sustainability:
  - a. indicator for sufficient country wide investment in **protected areas**, both under the IUCN categories covering strict nature reserves and other categories where economic

activities are allowed, but under conditions that allow to preserve valuable biodiversity and ecosystem services

- b. indicator for sufficient country wide investment in **preservation of the forested area**

Based on the combination of the general principles developed under section 2 and the operationalisation of the World Bank code of conduct (which reflects a broad approach to land use management in an ecosystems' approach), a set of 5 country level sub-indicators can be selected:

- policies for investment in protected areas
- policies for preservation of forested area
- food security policies
- control and monitoring of corruption
- respect of the rule of law

In the following sub-sections, a preliminary analysis is provided of these sub-indicators with the following objectives in mind

- 1) Construct a rapid diagnostic methodology of ranking between countries, as a “first” step. Such a ranking can be used to rapidly identify **“red flag” countries** (which are countries that score below a specified threshold or that belong to the group of worst performing countries) or to construct an assessment across a broad range of countries. Both these two possible uses of the methodology are illustrated in the sections below.
- 2) In a second step, for biomass sourced from countries which score very badly in this comparative assessment, a more in depth assessment is needed to check the potential harmful impact on biodiversity
- 3) Discuss issues for further research, needed for the development of the governance indicator

### 3.1 Policies for investment in protected areas

#### 3.1.1 Analysis of the indicator

The main online platform where users can access statistics and download data on protected areas is the platform “Protected Planet” ([www.protectedplanet.net](http://www.protectedplanet.net)). It's managed by the United Nations Environment Programme's World Conservation Monitoring Centre (UNEP-WCMC) with support from IUCN and its World Commission on Protected Areas (WCPA). The platform provides access to statistics of the World Database on Protected Areas.

To construct an indicator that can be used as a comparative tool amongst countries, information is needed that is organised according to internationally recognized standards and that is available for a substantial number of countries. An obvious candidate is the internationally recognized IUCN list of management categories, which are systematically reported in the database. Other designations, such as national or regional designations are often too ad hoc to be compared across countries, or do not provide an appropriate basis for a global indicator. Moreover, if protected areas fall under such national or regional designations they are also reported under the IUCN management categories, whenever they comply with these standards. So using the IUCN categories is also an appropriate way for verifying the level of protection that is really applied to designated protected areas. An additional advantage of this approach is that separate data for each of the IUCN categories is easily accessible through the IBAT portal (<https://www.ibat-alliance.org/ibat-conservation/home>). Finally, the use of



these standards will call attention to country officials of the importance of the IUCN categories and contribute to further improvement on the reporting quality in the World Database on Protected Areas and the IBAT portal, whenever countries have provided incomplete or inaccurate data.

Based on these considerations, a preliminary indicator can be constructed by **combining the total terrestrial protected area of a country with the percentage of this area that falls under one of the 6 IUCN management categories**. For example, for Belgium, 23% of the total land area is covered by designated protected areas, 51,06 % of which falls under one of the IUCN management categories (so total of 11,7 % of the terrestrial land areas is protected under one of the IUCN management categories). In contrast, for Algeria, only 8% of the land area is covered by protected areas and only 21,05% of this protected area falls under one of the IUCN management categories (so a total of 1,68% of the terrestrial land areas is protected under one of the IUCN management categories). The latter is one of the lowest level of protection amongst comparable countries (for instance Egypt has 7,02% of its land under one of the IUCN management categories).

The data on the sub-indicator for investment in protected areas can be used to define a minimal acceptable threshold of investment in protected areas. Such threshold (to be defined in the next section 4 on “combination of the indicators”) can for example be based on a score of 50% below the average investment of comparable countries with similar economic potential (classified in low, middle and high income countries). Probably (to be verified in the next section on the “combination of the indicators”) Algeria will rank below this threshold. This “red flag” indication does not automatically mean that investment is not desirable in this country, but that additional information needs to be gathered to verify the sustainability of the land use choices in this country, before any biomass related investment can be made which aims to comply with minimal international sustainability standards as discussed above.

3.1.2 Definition of the IUCN management categories

**IUCN Category I-II**

The management categories are part of IUCN's (The International Union for Conservation of Nature) global set of standard categories to classify protected areas, both terrestrial and marine, based on management objectives. These allow comparison between countries; unlike national naming designations (e.g. national park or forest reserve) which are not standardized internationally and do not necessarily convey information on management targets.

| Category | Main management target | Definition  |
|----------|------------------------|---|
| Ia       | Science                | Area of land and/or sea possessing some outstanding or representative ecosystems, geological or physiological features and/or species, available primarily for scientific research and/or environmental monitoring.                 |
| Ib       | wilderness protection  | Large area of unmodified or slightly modified land, and/or sea, retaining its natural character and influence, without permanent or significant habitation, which is protected and managed so as to preserve its natural condition. |

|    |                                     |   |
|----|-------------------------------------|---|
| II | ecosystem protection and recreation | Natural area of land and/or sea, designated to (a) protect the ecological integrity of one or more ecosystems for present and future generations, (b) exclude exploitation or occupation inimical to the purposes of designation of the area and (c) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible. |
|----|-------------------------------------|---|

### IUCN Category III-IV

Part of IUCN's global set of standard categories to classify protected areas, both terrestrial and marine, based on management objectives. These allow comparison between countries; unlike national naming designations (e.g. national park or forest reserve) which are not standardized internationally and do not necessarily convey information on management targets.

| Category | Main management target                       | Definition  |
|----------|--|---|
| III      | conservation of specific natural features    | Area containing one or more, specific natural or natural/cultural feature which is of outstanding or unique value because of its inherent rarity, representative or aesthetic qualities or cultural significance. |
| IV       | conservation through management intervention | Area of land and/or sea subject to active intervention for management purposes so as to ensure the maintenance of habitats and/or to meet the requirements of specific species                                    |

### IUCN Category V-VI

Part of IUCN's global set of standard categories to classify protected areas, both terrestrial and marine, based on management objectives. These allow comparison between countries; unlike national naming designations (e.g. national park or forest reserve) which are not standardized internationally and do not necessarily convey information on management targets.

| Category | Main management target                         | Definition   |
|----------|--|--|
| V        | landscape/seascape conservation and recreation | Area of land, with coast and sea as appropriate, where the interaction of people and nature over time has produced an area of distinct character with significant aesthetic, ecological and/or cultural value, and often with high biological diversity. Safeguarding the integrity of this traditional interaction is vital to the protection, maintenance and evolution of such an area. |
| VI       | sustainable use of natural ecosystems          | Area containing predominantly unmodified natural systems, managed to ensure long-term protection and maintenance of biological diversity, while providing at the same time a sustainable flow of natural products and services to meet community needs.  |

### 3.1.3 Some country examples from the World Database on Protected Areas

#### Egypt

Number of Protected areas

**50**

Protected areas coverage



Area terrestrial (Ref 1 ↓)

Polygons/Points ratio

**94%**

Polygons

**6%**

Points

**984,998 km<sup>2</sup>**

Total Land Area

**13.0%**

coverage

**129,394 km<sup>2</sup>**

Land Area Protected

IUCN Management categories

| Management categories | Count | % |
|-----------------------|-------|---|
|-----------------------|-------|---|

|                |        |     |
|----------------|--------|-----|
| Ia             | 510.0  |     |
| II             | 2      | 4.0 |
| III            | 2      | 4.0 |
| IV             | 2      | 4.0 |
| V              | 3      | 6.0 |
| VI             | 918.0  |     |
| Not Reported   | 2448.0 |     |
| Not Applicable | 3      | 6.0 |

Governance types

| Name | Governance type | Count | % |
|------|-----------------|-------|---|
|------|-----------------|-------|---|

|  |  |   |        |
|--|--|---|--------|
| Federal or national ministry or agency |  | ? | 2448.0 |
| Not Reported                           |  | ? | 2652.0 |

National designations

**11**

| Categories          | Count |
|---------------------|-------|
| National Park       | 3     |
| Natural Monument    | 2     |
| Protected Area      | 13    |
| Protected Landscape | 3     |

Regional designations

**0**

| Categories | Count |
|------------|-------|
|------------|-------|

International designations

## China

Number of Protected areas

**2,155**

Polygons/Points ratio

**35%**

Polygons

**65%**

Points

Protected areas coverage



Area terrestrial (Ref 1 ↓)

**17.0%**

coverage

**1,598,471 km<sup>2</sup>**

Land Area Protected

**9,361,609 km<sup>2</sup>**

Total Land Area

Number of sources

IUCN Management categories

| Management categories | Count | %    |
|-----------------------|-------|------|
| la                    | 1     | 0.05 |
| IV                    | 2     | 0.09 |
| V                     | 1862  | 86.4 |
| VI                    | 22    | 1.02 |
| Not Reported          | 22410 | 39   |
| Not Applicable        | 44    | 2.04 |

Governance types

| Name                                   | Governance type | Count | %         |
|--|-----------------|-------|-----------|
| Sub-national ministry or agency        |                 | ?     | 200 9.28  |
| Federal or national ministry or agency |                 | ?     | 6 0.28    |
| Not Reported                           |                 | ?     | 194990.44 |

National designations

**8**

| Categories              | Count |
|-------------------------|-------|
| Nature Reserve          | 2040  |
| Protected Area          | 1     |
| National Nature Reserve | 2     |
| Sanctuary               | 2     |
| Scenic Area             | 18    |
| Nature Preserve         | 1     |

Regional designations

**0**

Categories Count

International designations

**3**

| Categories                                       | Count |
|--|-------|
| World Heritage Site                              | 15    |
| UNESCO-MAB Biosphere Reserve                     | 29    |
| Ramsar Site, Wetland of International Importance | 45    |

## Algeria

Number of Protected areas

**78**

Polygons/Points ratio

**15%**

Polygons

**85%**

Points

Protected areas coverage



Area terrestrial [\(Ref 1 ↓\)](#)

**8.0%** **174,220 km<sup>2</sup>**  
coverage Land Area Protected

**2,324,459 km<sup>2</sup>**  
Total Land Area

IUCN Management categories [↗](#)

| Management categories <a href="#">↕</a> | Count <a href="#">↕</a> | % <a href="#">↕</a> |
|---|-------------------------|---------------------|
| la                                      | 5                       | 6.58                |
| II                                      | 1114.47                 |                     |
| Not Reported                            | 5369.74                 |                     |
| Not Applicable                          | 7                       | 9.21                |

Governance types [↗](#)

| Name <a href="#">↕</a>                 | Governance type <a href="#">↕</a> | Count <a href="#">↕</a> | % <a href="#">↕</a> |
|--|-----------------------------------|-------------------------|---------------------|
| Federal or national ministry or agency |                                   | ?                       | 1823.08             |
| Not Reported                           |                                   | ?                       | 6076.92             |

National designations [↗](#)

**5**

| Categories <a href="#">↕</a> | Count <a href="#">↕</a> |
|------------------------------|-------------------------|
| National Park                | 9                       |
| Nature Reserve               | 4                       |
| Marine Nature Reserve        | 1                       |
| Hunting Reserve              | 3                       |
| Cultural Park                | 2                       |

Regional designations [↗](#)

**1**

| Categories <a href="#">↕</a>   | Count <a href="#">↕</a> |
|--|-------------------------|
| Specially Protected Areas of Mediterranean Importance (Barcelona Convention) | 2                       |

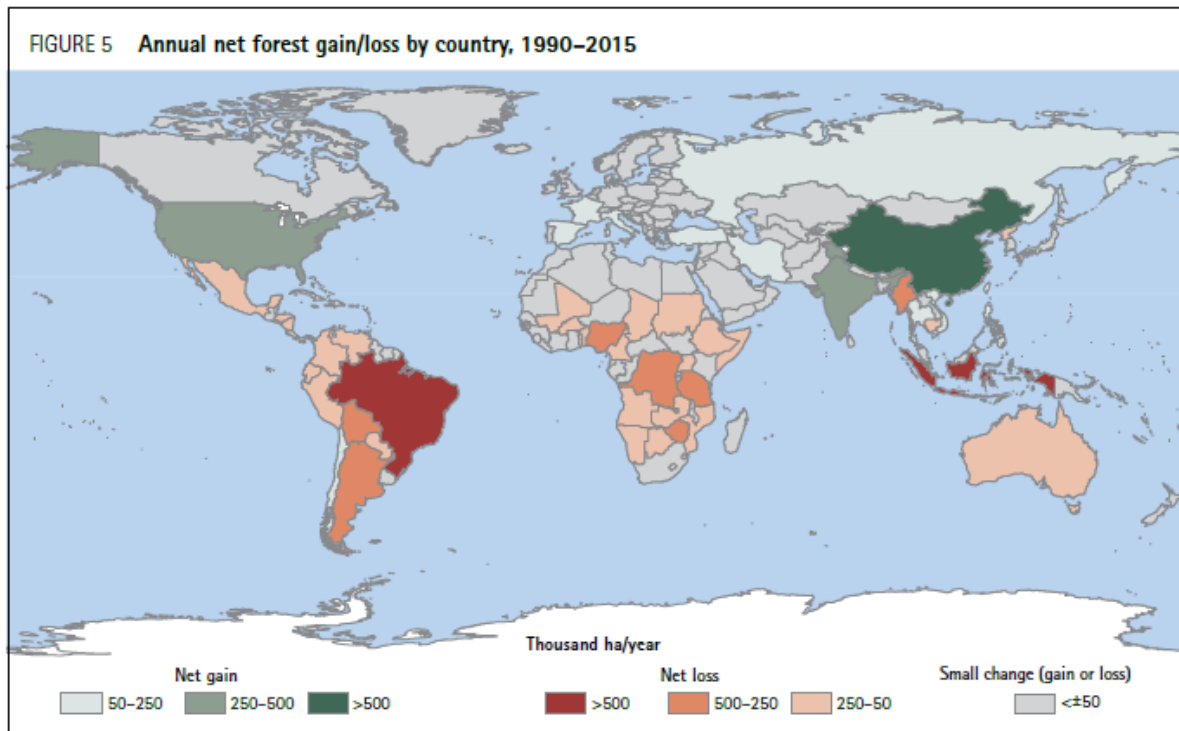
International designations [↗](#)

**3**

| Categories <a href="#">↕</a>                     | Count <a href="#">↕</a> |
|--|-------------------------|
| World Heritage Site                              | 1                       |
| UNESCO-MAB Biosphere Reserve                     | 6                       |
| Ramsar Site, Wetland of International Importance | 50                      |

### 3.2 Policies for the preservation of forested area

Deforestation of natural forest areas is one of the major causes of biodiversity decline and decrease in the provision of ecosystem services. Substituting natural forests with land for biomass production might therefore have considerable negative impacts. The sub-indicator on the rate of deforestation can help to identify countries where a danger of such substitution exists, due to the lack of appropriate and effective forest preservation policies. In such countries, additional information needs to be gathered before any biomass related economic activity.



The authoritative source on deforestation is the FAO's Global Forest Resources Assessment 2015. A red flag policy **indicator can be constructed based on** the data on the overall rate of annual forest change between 1990-2015 and **on signs of deterioration** or improvement of this rate (in case of negative sign) **between 2010-2015**. On the table below, for example, one can see that Nigeria is a major source of concern. It is a country with a substantial forest area (7,7 % of its land area), with a substantial net loss of forest area. Moreover, the average rate of forest loss increased in the period 2010-2015 (-8,1 %) as compared to the average over 1990-2015 (- 5%). This in turn invites to a more in depth analysis, to see the exact source of this worrying deforestation rate.

**QUESTION 1: WHAT IS THE AREA OF FOREST AND OTHER WOODED LAND AND HOW HAS IT CHANGED OVER TIME?**

**Table 1. Forest and other wooded land 2015**

| Country/Territory | Forest   |                |             | Other wooded land |                |             | Other land |                          | Inland water | Land area |
|-------------------|----------|----------------|-------------|-------------------|----------------|-------------|------------|--------------------------|--------------|-----------|
|                   | 1 000 ha | % of land area | Tier status | 1 000 ha          | % of land area | Tier status | 1 000 ha   | of which with tree cover | 1 000 ha     | 1 000 ha  |
| Guatemala         | 3540     | 33.0           | 2           | 1334              | 12.4           | 2           | 5842       | 200                      | 173          | 10716     |
| Guernsey          | r        | 2.6            | 1           | 0                 | 0.0            | 1           | 8          | 0                        | 0            | 8         |
| Guinea            | 6364     | 25.9           | 1           | 5850              | 23.8           | 1           | 12358      |                          | 14           | 24572     |
| Guinea-Bissau     | 1972     | 70.1           | 1           | 224               | 8.0            | 1           | 616        |                          | 801          | 2812      |
| New Zealand       | 10152    | 38.6           | 3           | 1060              | 4.0            | 3           | 15119      |                          | 440          | 26331     |
| Nicaragua         | 3114     | 25.9           | 3           | 2219              | 18.4           | 3           | 6701       |                          | 1003         | 12034     |
| Niger             | 1142     | 0.9            | 2           | 3140              | 2.5            | 2           | 122388     | 8000                     | 30           | 126670    |
| Nigeria           | 6993     | 7.7            | 1           | 2681              | 2.9            | 1           | 81403      | 270                      | 1300         | 91077     |

**Table 2. Extent of forest 1990–2015**

| Country/Territory | Forest area (1 000 ha) |       |       |       |       |            | Annual change rate |      |             |      |             |      |             |      |
|-------------------|------------------------|-------|-------|-------|-------|------------|--------------------|------|-------------|------|-------------|------|-------------|------|
|                   | 1990                   | 2000  | 2005  | 2010  | 2015  | Tier trend | 1990–2000          |      | 2000–2010   |      | 2010–2015   |      | 1990–2015   |      |
|                   |                        |       |       |       |       |            | 1 000 ha/yr        | %    | 1 000 ha/yr | %    | 1 000 ha/yr | %    | 1 000 ha/yr | %    |
| Guatemala         | 4748                   | 4208  | 3938  | 3722  | 3540  | 2          | -54.0              | -1.2 | -48.6       | -1.2 | -36.4       | -1.0 | -48.3       | -1.2 |
| Guernsey          | r                      | r     | r     | r     | r     | 1          | 0.0                | 0.0  | 0.0         | 0.0  | 0.0         | 0.0  | 0.0         | 0.0  |
| Guinea            | 7264                   | 6904  | 6724  | 6544  | 6364  | 1          | -36.0              | -0.5 | -36.0       | -0.5 | -36.0       | -0.6 | -36.0       | -0.5 |
| Guinea-Bissau     | 2216                   | 2120  | 2072  | 2022  | 1972  | 1          | -9.6               | -0.4 | -9.8        | -0.5 | -10.0       | -0.5 | -9.8        | -0.5 |
| New Zealand       | 9658                   | 10139 | 10183 | 10151 | 10152 | 3          | 48.1               | 0.5  | 1.2         | 0.0  | 0.2         | 0.0  | 19.8        | 0.2  |
| Nicaragua         | 4514                   | 3814  | 3464  | 3114  | 3114  | 3          | -70.0              | -1.7 | -70.0       | -2.0 | 0.0         | 0.0  | -56.0       | -1.5 |
| Niger             | 1945                   | 1328  | 1266  | 1204  | 1142  | 2          | -61.7              | -3.7 | -12.4       | -1.0 | -12.4       | -1.1 | -32.1       | -2.1 |
| Nigeria           | 17234                  | 13137 | 11089 | 9041  | 6993  | 1          | -409.7             | -2.7 | -409.6      | -3.7 | -409.6      | -5.0 | -409.6      | -3.5 |

Table on forest data: illustration from p.5 and p. 12 of the FAO “Global Forest Resources Assessment”, Desk Reference document (2015).

### 3.3 Food security policies

A key issue for sustainable biomass economic activities, from the point of view of sustainable management of the available land resources in a broad ecosystems’ management perspective, is the displacement of agricultural crop land used for food and feed production by industrial biomass/biofuel investment. Such displacement often has direct consequences on biodiversity and ecosystem services, as it is likely to increase pressure for converting natural forests or protected areas to satisfy food security needs.

It is obviously difficult to construct a countrywide indicator of effective land use displacement. However, reliable data exists on policies in countries where major food security concerns exist and where no appropriate policy is in place to revert this situation. In those cases, a high degree of care should be given to check the land use policy in favour of small-holder farmers and/or supporting

increase in agricultural land for local production, as compared for example to a disproportionate allocation of land to export crops (both for food/feed production and industrial biomass).

A good candidate for such a “red flag” indicator is based on the decrease in malnutrition, as this is an indicator for which detailed data is gathered every year. For the “test run” on this indicator in this report, we use the date published in the report on the achievement of the Hunger Target of the Millenium Development Goal:

“Millenium Development Goal 1, target 1C: halve, between 1990-92 and 2015, the proportion of people suffering from undernourishment, or reduce its proportion below 5 percent”

On the map below, countries

- in green: they have achieved the Target 1C;
- in yellow: they did not achieve the target, with slow progress;
- in red: they **did not achieve the target with lack of progress or deterioration.**

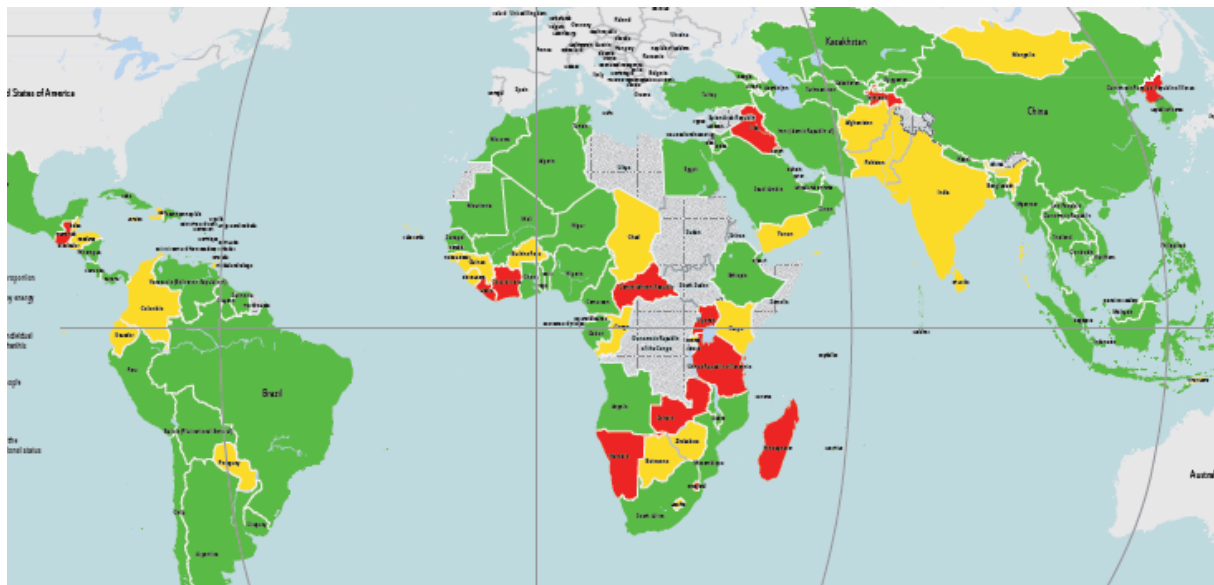


Figure. Achievement of the Millenium Development Goal Hunger Target, map available at <http://www.fao.org/3/a-i4674e.pdf> (in red: countries such as Guatemala, Madagascar, Namibia)

### 3.4 Control and monitoring of corruption

Three major international sources provide data on country level control and monitoring of corruption: the World Bank “Worldwide Governance Indicators”, the reports of Transparency International and the data from the World Justice Project.

The data from the World Bank and most of the data of Transparency International are based on “perception” of corruption and other major governance features. As stated above in the “general principles” section, they fail therefore the quality test of reliable data for assessing the real phenomena in the country. Moreover, the World Bank data is based on a compilation of other data sources that are gathered often for entirely different purposes. Only the data from the World Justice project uses detailed original surveys on specific aspects of corruption.

For completeness, it is interesting to mention that the reports of Transparency International contain some sections with original survey data on instances of observed bribery in a selected list of target



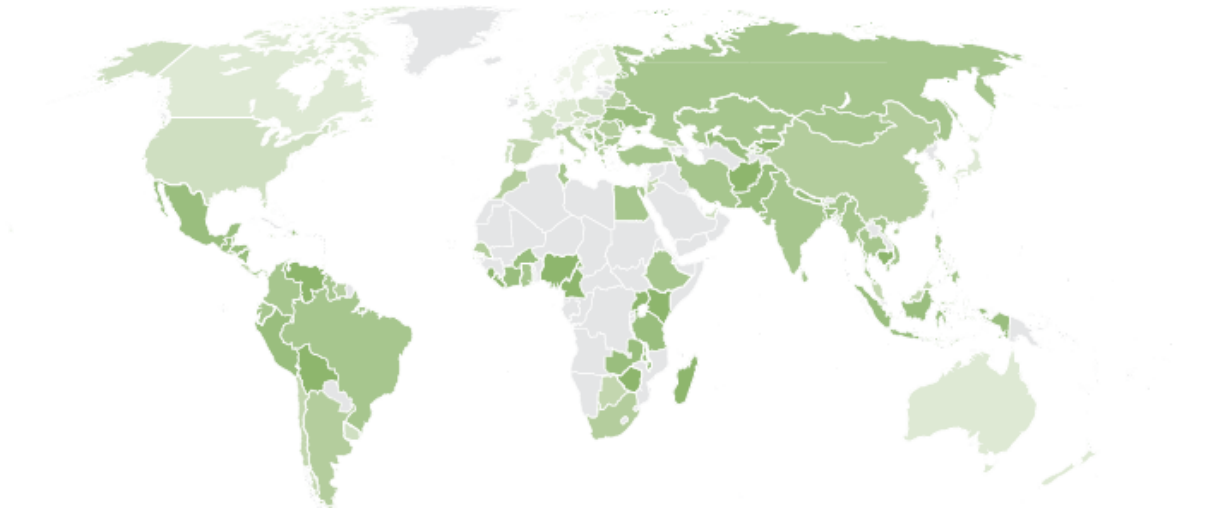
countries. This data is clearly relevant and can be used to complete other data sources for constructing the indicator (for instance when there is a need to conduct more in depth case study research). However, it too incomplete to be used to make the comparative ranking.

The only systematic assessment based on original survey data is from the World Justice Project. This Project covers 113 countries. The 2016 data is based on surveys of more than 110.000 households and 2700 expert interviews on a range of governance features and is updated yearly through new surveys and reports. Even though it does not cover all the countries, it is nevertheless the best candidate to construct this sub-indicator. For the other countries, an extrapolation of the data based on a matching with the surveys on bribery by Transparency International can be used. Finally, for the remaining countries, one can refer, for the moment being, to the World Bank data.

**Absence of corruption is measured** in the World Justice Project through gathering data **with respect to government officers in the executive branch, the judiciary, the military, the police and the legislature. For each of these branches, three forms of corruption are considered: bribery, improper influence by public or private interests, and misappropriation of public funds or other resources.**

The table below shows the countries with the lowest score on the aggregated “absence of corruption” data, along with a map giving an overall idea of the country coverage. Rank “113” in the table corresponds to the country with the worst score (lowest “absence of corruption” amongst the 113 countries surveyed in the World Justice project)

| COUNTRY/<br>JURISDICTION | SCORE | GLOBAL<br>RANKING |
|--------------------------|-------|-------------------|
| Bulgaria                 | 0.41  | 79                |
| Mongolia                 | 0.41  | 80                |
| Zambia                   | 0.40  | 81                |
| Tanzania                 | 0.39  | 82                |
| Nepal                    | 0.38  | 83                |
| Indonesia                | 0.38  | 84                |
| Cote d'Ivoire            | 0.38  | 85                |
| Burkina Faso             | 0.38  | 86                |
| Nicaragua                | 0.37  | 87                |
| Lebanon                  | 0.36  | 88                |
| Ukraine                  | 0.36  | 89                |
| Malawi                   | 0.36  | 90                |
| Peru                     | 0.36  | 91                |
| Honduras                 | 0.36  | 92                |
| Dominican Republic       | 0.34  | 93                |
| Bangladesh               | 0.34  | 94                |
| Guatemala                | 0.34  | 95                |
| Uzbekistan               | 0.33  | 96                |
| Pakistan                 | 0.33  | 97                |
| Albania                  | 0.33  | 98                |
| Mexico                   | 0.32  | 99                |
| Nigeria                  | 0.30  | 100               |
| Sierra Leone             | 0.30  | 101               |
| Madagascar               | 0.30  | 102               |
| Bolivia                  | 0.29  | 103               |
| Zimbabwe                 | 0.29  | 104               |
| Moldova                  | 0.28  | 105               |
| Kyrgyzstan               | 0.28  | 106               |
| Uganda                   | 0.27  | 107               |
| Kenya                    | 0.26  | 108               |
| Liberia                  | 0.26  | 109               |
| Venezuela                | 0.25  | 110               |
| Cambodia                 | 0.24  | 111               |
| Cameroon                 | 0.24  | 112               |
| Afghanistan              | 0.23  | 113               |



Map of the results of the survey amongst 113 countries on a set of “absence of corruption” indicators (cf. text above) considered in the World Justice Project. Deepest dark shaded countries have the highest corruption (that is: the lowest score on “absence of corruption”). For countries in grey, no survey data are available yet from the World Justice Project.

### 3.5 Respect of the rule of law

For respect of the rule of law, the two major data sources are the World Bank “Worldwide Governance Indicators” and the data from the World Justice Project. The same comments as under 3.4. apply and the main data source considered is the data from the World Justice Project. For the countries that were not surveyed under this project, the World Bank data can be used. Details on how to combine these two data sources will be provided under section 4.

We also considered a third possibility for building a “rule of law” indicator, more specifically related to biodiversity policy, which is the country specific effort to monitoring the implementation of the CITES convention. The major report in this context is the 2016 World Wildlife Crime Report (available on line). However, in the current stage, the data on the monitoring is incomplete. In addition to the incompleteness of the data, the top identified source countries of observed wildlife crime cases are the United States, Canada and Russia, a fact that might be related to the incomplete reporting in the current stage and would in any case require more in depth analysis (page 27 of the report). In any case, as also indicated in the introduction to the World Wildlife Crime Report, a wildlife crime indicator cannot be used directly as an indication of bad governance. However, in the future data from the new 2016 initiative on enforcement indicators might be useful to add to the identified governance indicators in this framing report:

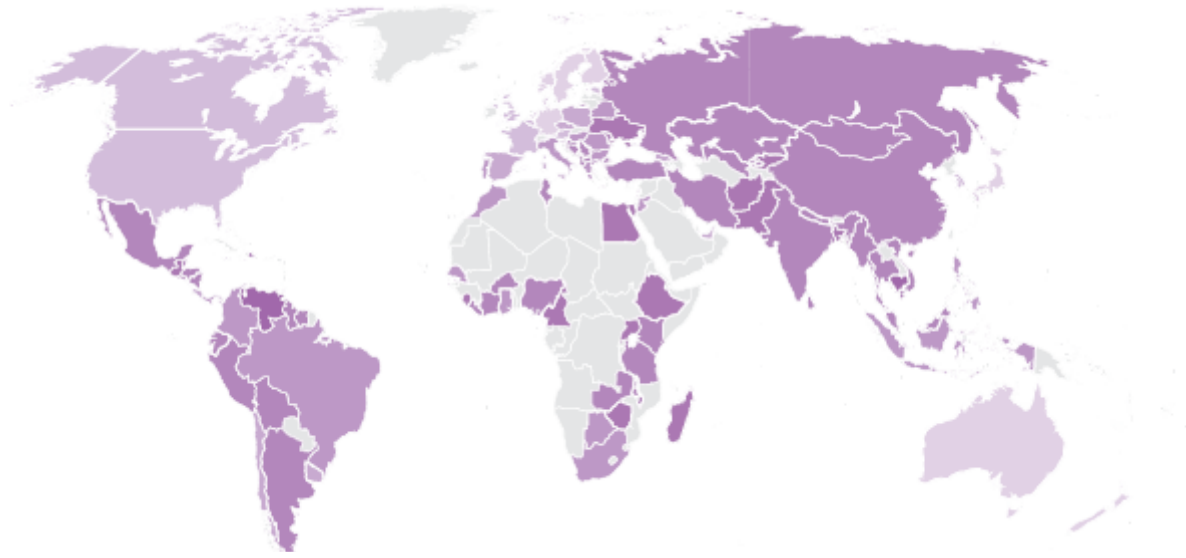
[https://cites.org/eng/news/pr/wildlife\\_crime\\_consortium\\_launches\\_enforcement\\_indicators\\_1301\\_2016](https://cites.org/eng/news/pr/wildlife_crime_consortium_launches_enforcement_indicators_1301_2016)

Rule of law is measured in the World Justice Project through factor 6 on “regulatory enforcement”. Factor 6 measures the extent to which regulations are effectively implemented and enforced without improper influence by public officials or private interests. It also includes whether administrative proceedings are conducted in a timely manner without unreasonable delays and whether due process is respected in administrative proceedings. This factor also addresses whether the government respects the property rights of people and corporations. Factor 6 is constructed through a combination of survey questions on the following 5 issues:

- Government regulations are effectively enforced
- Government regulations are applied and enforced without improper influence
- Administrative proceedings are conducted without unreasonable delay
- Due process is respected in administrative proceedings
- The government does not expropriate without lawful process and adequate compensation

The table below shows the countries with the lowest score on the aggregated data for the rule of law, along with a map giving an overall idea of the country coverage. The table shows the countries with the lowest score on the aggregated “rule of law” data, along with a map giving an overall idea of the country coverage. Rank “113” in the table corresponds to the country with the worst score (lowest “rule of law” amongst the 113 countries surveyed in the World Justice project)

| COUNTRY/<br>JURISDICTION | SCORE | GLOBAL<br>RANKING |
|--------------------------|-------|-------------------|
| Malawi                   | 0.45  | 79                |
| China                    | 0.45  | 80                |
| Uzbekistan               | 0.45  | 81                |
| Burkina Faso             | 0.45  | 82                |
| Zambia                   | 0.45  | 83                |
| Turkey                   | 0.44  | 84                |
| Mexico                   | 0.44  | 85                |
| Albania                  | 0.44  | 86                |
| Myanmar                  | 0.44  | 87                |
| Belize                   | 0.43  | 88                |
| Nigeria                  | 0.43  | 89                |
| Bolivia                  | 0.43  | 90                |
| Vietnam                  | 0.43  | 91                |
| Kenya                    | 0.43  | 92                |
| Tanzania                 | 0.42  | 93                |
| Honduras                 | 0.41  | 94                |
| Dominican Republic       | 0.41  | 95                |
| Lebanon                  | 0.41  | 96                |
| Moldova                  | 0.41  | 97                |
| Liberia                  | 0.41  | 98                |
| Bangladesh               | 0.40  | 99                |
| Ukraine                  | 0.40  | 100               |
| Guatemala                | 0.39  | 101               |
| Madagascar               | 0.38  | 102               |
| Cameroon                 | 0.38  | 103               |
| Kyrgyzstan               | 0.38  | 104               |
| Uganda                   | 0.37  | 105               |
| Afghanistan              | 0.36  | 106               |
| Sierra Leone             | 0.35  | 107               |
| Zimbabwe                 | 0.35  | 108               |
| Pakistan                 | 0.34  | 109               |
| Egypt                    | 0.33  | 110               |
| Ethiopia                 | 0.31  | 111               |
| Cambodia                 | 0.28  | 112               |
| Venezuela                | 0.21  | 113               |



Map of the results of the survey amongst 113 countries on a set of “rule of law” indicators (cf. text above) considered in the World Justice Project. Deepest dark shaded countries have the lowest respect of the rule of law (that is: the lowest score on “rule of law” indicators). For countries in grey, no survey data are available yet from the World Justice Project.

## 4 Combination of the indicators

This section will discuss various ways of constructing and combining the 5 selected indicators (depending on the construction of the thresholds, the weighting, etc.). The result of the various ways of combining the indicators will be presented in a simple diagrammatic way. In some projects, for example the World Justice Project, a full ranking is provided of all the countries (based on top tercile, middle tercile and bottom tercile). This is the method that will be tested in the second sub-section. However, for testing various combinations of the status and progress indicators, a focus on the worst performing countries in the bottom tercile might be useful as well. The objective of these various modes of calculating the combination is to have a better view on the important choices to be made for a more in depth analysis of the governance indicator.

### 4.1 Analysis of the Governance Indicators based on the worst performing countries in the bottom tercile of the database

This first section aims to test different ways to combine “static” indicators (giving the present status in a certain country) and temporal indicators (giving information on change over a certain period in time). A combination of these two kinds of indicators is often a good way to evaluate the effective governance or lack of effective governance in a certain field. The colours used in this section are at this stage purely informative, to see what kind of information can be extracted from available and reliable international databases. The test is made on the bottom tercile, where it is highly likely that biomass based investment had already a negative impact on sustainable biodiversity management or will nearly surely have such a negative impact in the absence of special additional measures such as internationally recognized certification of biomass related activities (along the line of some WWF initiatives for example).

**Forest policy** For the purpose of the development of the present tool, the forest data elaborated by the FAO presents some strong advantages. Indeed, in contrast to other approaches based on satellite data, the FAO approach is not based on tree cover, but on forested land. The advantage of forested land data is that it allows to make a distinction between type of forested lands, as three categories are considered in the FAO assessment: primary forest, naturally regenerated forests and planted forests. In the context of biodiversity policy, it is indeed important to be able to differentiate between changes in forested lands with higher *versus* lower biodiversity. Detailed country source data on these three categories of forest, and their evolution is available in the FAO database.

In this preliminary report, to keep the presentation of the results manageable, we illustrate the use of the forest indicator by considering the overall trend in forest change of the given countries. In a later stage the focus can shift to specific sub-indicators related to primary or naturally regenerated forest, if deemed necessary. The latter data is available in the FAO forest reports and therefore the proposed method in this report can be easily adapted to these more specific indicators. Such a decision could be taken on comparative assessment of these two proposed approaches, keeping in mind that the purpose of assessing the trends as a “proxy” for forest policy. As indicated in the introduction, a distinct methodology is being developed to assess the stage of biodiversity in this countries. As an illustration, it can be mentioned that countries like Indonesia and Guatemala with a worrying trend in the “overall” forest cover are also countries with a worrying trend as regards primary and naturally regenerated forests, in spite of their massive investment in forest plantations.

The threshold used for flagging countries with the worst forest policy is based on three categories of situations

(1) RED: Countries **with extreme forest degradation** ( $\geq 1\%$  per year, meaning  $\geq 25\%$  forest loss over a 25 years' period) and **where the forest degradation increased** in the period 2010-2015 as compared to the overall average in the period 1990-2015

(2) ORANGE: Countries **with extreme forest degradation** ( $\geq 1\%$  per year, meaning  $\geq 25\%$  forest loss over a 25 years' period), but where the degradation shows a slight improvement (slight improvement in the period 2010-2015 as compared to the overall average in the period 1990-2015)

(3) YELLOW:

- Countries **with very high forest degradation** (between 0,5% and 1%; 0,5% meaning  $>10\%$  forest loss over a 25 years' period) and **without any sign of improvement** in the period 2010-2015 as compared to the overall average in the period 1990-2015)
- Countries where the forest degradation was only moderate or inexistent before 2010, but where **an increase in the forest degradation is observed** between 2010-2015 to a level between 0,2% and 0,5% per year

When a country is flagged, biomass based investment in that country are likely to already be a major factor in the dramatic unsustainability situation. More in depth information gathering on the causes of these governance failures in these countries is urgently needed to change course. Moreover, such information gathering can also play a positive role in consciousness raising about the priorities in national and international forest policy change in other countries which are not part of the bottom tercile, but where major improvements still need to be made.

### **Protected areas policy**

For flagging the countries with the most extreme failures in the protected areas policies, we analysed countries where less than 2,5% of the territory is covered with protected areas. This threshold corresponds to the 10% worst countries worldwide (data from the international database [www.protectedplanet.net](http://www.protectedplanet.net)).

(1) RED: Less than 2,5% of the territory covered with protected areas, with less than 1,25% of the territory declared under IUCN management categories.

(2) ORANGE: Less than 2,5% of the territory covered with protected areas, with between 1,25% and 2,5% declared under IUCN management categories

Comment on data

- For Turkey, we modified the data from the protectedplanet database by using the updated information from OECD, environmental performance review, 2008

### **Food security policy**

Most countries in the world have known a very big increase in food security over the last two decades. Worldwide, % of undernourished decreased from 18,6% of the overall population in 1990 to 10,9% of the world population in 2015, in spite of a growth in the world population over that same period. For instance in China % of undernourished in the population decreased from 23,9% in 1990 to 9,3% in 2015; in India from 23,7% to 15,2% ; in Angola from 63,5% to 14,2%. In contrast to this worldwide trend over the last 25 years, the percentage of undernourished persons in some countries remains far above the world average and in some countries there has even been a deterioration in food security

over that same 25 years period. Seen the contrast with the overall positive accomplishments, one can consider that these latter countries have a very worrisome food security policy for their population. In such cases, it is highly likely that serious governance failures exist and it is highly likely that biomass based investment already plays a major role in deteriorating the situation of the deprived populations. If such situation occurs, a rapid assessment of the situation in the country can show if the worrisome situation is indeed related to governance failures, or to some exceptional events that might have impacted the country over that period (such as a natural disaster). In some countries there is already clear evidence that export oriented biomass based investment contributed directly to worsening the food security situations by shifting away land use from local food production.

Based on this rationale and the analysis of the data, we tested the following three ways to combine the governance indicators:

- (1) RED: Above 25% of the population is undernourished and deterioration over the period 1990-2015
- (2) ORANGE: Above 25% of the population is undernourished in spite of some improvement
- (3) YELLOW: Below 25% of the population is undernourished, but one observes a deterioration of the situation

### **Control of corruption**

Two indicators are used for the control of corruption:

- (1) The indicator of the WJP Rule of Law report, based on in depth interviews and original research in each country. The threshold was set at the 10% worse country score for the “absence of corruption”. However, for some countries data are missing for this indicator
- (2) The indicator of the World Bank, which is based on the combination of other survey data, but which has data for all countries. The threshold was set in two steps by (1) comparing the scores for the list of all the countries that were in both World Bank and WJP databases and (2) using the World Bank index that corresponds to the country having the 10% worst country score on the WJP database. The first step allowed to check the consistency between the two approaches. Consistency was observed, with similar results for all the countries in the sub-sample of the 1 to 15% of worst countries in both databases.

As a conclusion of this preliminary analysis, we suggest to keep both indicators in the overview table. However, for the country specific analysis in section 5 we suggest to use the WJP indicator, whenever data is available, and to use the World Bank data only in absence of WJP data.

### **Other indicators**

The “regulatory enforcement” indicator does not exist for all countries. We therefore checked the consistency with the World Bank rule of law indicator, to verify if the latter indicator could be used to extrapolate the list. However, there is no strong correspondence between both. So we did not consider this indicator because of lack of a complete and reliable dataset.

Finally, we added one control variable to the list, which is the GDP per country. Even though this indicator has also many shortcomings (for instance it should not be interpreted as an indication of human well-being), it is an indicator that is often used in the governance debate. In particular, the inclusion of this indicator allows to check if there would be a correlation between the chosen indicators in this report and the GDP level of a country. At the present stage of the preliminary analysis in this

report, no systematic correlation between bad/good performance on one of the chosen indicators and the GDP ranking is observed.

Source data used for this GDP in this report are the 2015 world bank data (<http://data.worldbank.org/indicator/NY.GDP.PCAP.CD>)

## 4.2 Illustrative analysis

The table in annex 1 illustrates one kind of analysis that can be made based on the available data. The illustration considers the specific sub-group of the worst performing countries. Most data is complete, except for

(1) protected areas in small Island states: the data is available, but still needs to be added to the analysis (indicted in grey)

(2) food security in high income countries: the data is probably available in other data sets, and can be added if deemed relevant for the development of the tool

From a purely visual analysis of the data on the bottom tercile, it is clear that there countries might perform well on one of the features, but badly on another. Therefore, it seems advisable to keep the various dimensions clearly separately visible. An arithmetic sum (after bringing the indicators on a common scale) of the indicators runs the danger of losing important information on the features considered separately. Section 4.3 and section 5 provides some further test runs on the data to illustrate the direction for further work on a way to keep the various dimensions separately visible in the presentation of the data.

Second, it is clear that the corruption index as such does not imply a worrisome governance status of biodiversity related issues. For instance Venezuela ranks badly on corruption, but has no clear-cut failure in biodiversity related policies analysed in the report. However, one can safely consider that a worrisome corruption situation has a systematic impact on worsening some of the policy domains considered and that it might cast doubt on official information, for instance regarding compliance with biodiversity related policies (the preferred use of the internationally elaborated indicators of observed changes in this reports is also a way to overcome this problem). A more in depth quantitative correlation study should allow to unravel one what biodiversity governance indicators corruption has the most impact. In any case, from the analysis of the worst case countries, it is clear that a combination of indicators needs to be consider in the evaluation of the governance situation in a given country.



### 4.3 Results for the world-wide country datasets

The following tables provide a different way of analysing the data: based on the bottom tercile of worst performing countries (in red), the middle tercile (in orange) and the upper tercile (in blue).

|                              | BIODIV: protected areas                      |  | FAO FOREST DATA    |                                  |                                  | FOOD INSECURITY                  |                       | Corruption                             |                                 |   | GDP per capita ranking (1 = highest; 153 = lowest) |
|------------------------------|--|--|--------------------|----------------------------------|----------------------------------|----------------------------------|-----------------------|--|---------------------------------|---|--|
|                              | % territory which is declared protected area | % protected area which is IUCN not reported or IUCN not applicable | % land area (2015) | % annual change rate (1990-2015) | % annual change rate (2010-2015) | % undernourished 2015 (1 to 171) | Change of % 1990-2015 | World Bank Control of corruption index | WJP Absence of corruption index | World Bank Ranking (1= best; 172 = worst) |  |
| Afghanistan,AFG              | 0,1  | 46,15  | 2,1                | 0                                | 0                                | 26,8                             | -9                    | -1,34                                  | 0,23                            | 163                                       | 139  |
| Albania,ALB                  | 17   | 6,9  | 28,2               | -0,1                             | -0,1                             |                                  |                       | -0,44                                  | 0,33                            | 99  | 91   |
| Algeria,DZA                  | 8  | 78,95  | 0,8                | 0,6                              | 0,4                              | 5                                | na                    | -0,68                                  |                                 | 120                                       | 87   |
| American Samoa,ASM           | 4  | 0  | 87,7               | -0,2                             | -0,2                             | 5                                | na                    | 1,25                                   |                                 | 28  |  |
| Andorra,AND                  | 21   | 100  | 34                 | 0                                | 0                                |                                  |                       | 1,25                                   |                                 | 29  |  |
| Angola,AGO                   | 7  | 7,14   | 46,4               | -0,2                             | -0,2                             | 14,2                             | -77,6                 | -1,40                                  |                                 | 165                                       | 88   |
| Anguilla,AIA                 | 6  | 100  | 61,1               | 0                                | 0                                |                                  |                       | 1,25                                   |                                 | 30  |  |
| Antigua and Barbuda,ATG      | 19   | 56,25  | 22,3               | -0,2                             | 0                                |                                  |                       | 0,67                                   | 0,66                            | 47  | 46   |
| Argentina,ARG                | 9  | 16,89  | 9,9                | -1                               | -1,1                             | 5                                | na                    | -0,59                                  | 0,51                            | 111                                       | 48   |
| Armenia,ARM                  | 23   | 8,57   | 11,8               | 0                                | 0,1                              | 5,8                              | -78,8                 | -0,45                                  |                                 | 101                                       | 97   |
| Aruba,ABW                    | 1  | 100  | 2,3                | 0                                | 0                                |                                  |                       | 1,31                                   |                                 | 22  |  |
| Australia,AUS                | 17   | 0,88   | 16,2               | -0,1                             | 0,2                              |                                  |                       | 1,91                                   | 0,83                            | 10  | 6  |
| Austria,AUT                  | 28   | 23,6   | 46,9               | 0,1                              | 0                                |                                  |                       | 1,49                                   | 0,84                            | 20  | 14   |
| Azerbaijan,AZE               | 10   | 8,11   | 13,8               | 1,2                              | 2,5                              | 5                                | na                    | -0,82                                  |                                 | 134                                       | 77   |
| Bahamas,BHS                  | 31   | 72,41  | 51,4               | 0                                | 0                                |                                  |                       | 1,29                                   | 0,64                            | 24  | 30   |
| Bahrain,BHR                  | 7  | 75   | 0,8                | 4,2                              | 2,8                              |                                  |                       | 0,17                                   |                                 | 62  | 31   |
| Bangladesh,BGD               | 5  | 27,45  | 11                 | -0,2                             | -0,2                             | 16,4                             | -49,9                 | -0,88                                  | 0,34                            | 138                                       | 122  |
| Barbados,BRB                 | 1  | 22,22  | 14,7               | 0                                | 0                                | 5                                | na                    | 1,79                                   | 0,7                             | 15  | 43   |
| Belarus,BLR                  | 9  | 4,15   | 41,6               | 0,4                              | 0,2                              |                                  |                       | -0,37                                  | 0,52                            | 88  | 75   |
| Belgium,BEL                  | 23   | 49,04  | 22,6               | 0                                | 0,1                              |                                  |                       | 1,58                                   | 0,78                            | 19  | 20   |
| Belize,BLZ                   | 38   | 7,76   | 59,9               | -0,7                             | -0,4                             | 6,2                              | -36,2                 | -0,21                                  | 0,48                            | 78  | 82   |
| Benin,BEN                    | 29   | 91,38  | 39                 | -1,2                             | -1,1                             | 7,5                              | -73,4                 | -0,61                                  |                                 | 115                                       | 131  |
| Bermuda,BMU                  | 6  | 29,58  | 20                 | 0                                | 0                                |                                  |                       | 1,25                                   |                                 | 31  |  |
| Bhutan,BTN                   | 48   | 10   | 72,3               | 0,4                              | 0,4                              |                                  |                       | 0,98                                   |                                 | 35  | 103  |
| Bolivia,BOL                  | 31   | 97,01  | 50,6               | -0,5                             | -0,5                             | 15,9                             | -58,1                 | -0,68                                  | 0,29                            | 121                                       | 100  |
| Bosnia and Herzegovina,BIH   | 2  | 48,57  | 42,8               | 0                                | 0                                |                                  |                       | -0,37                                  | 0,43                            | 90  | 85   |
| Botswana,BWA                 | 29   | 9  | 19,1               | -0,9                             | -0,9                             | 24,1                             | -4,1                  | 0,84                                   | 0,62                            | 42  | 70   |
| Brazil,BRA                   | 29   | 50,16  | 59                 | -0,4                             | -0,2                             | 5                                | na                    | -0,43                                  | 0,45                            | 97  | 62   |
| Brunei Darussalam,BRN        | 47   | 35,71  | 72,1               | -0,3                             | 0                                | 5                                | na                    | 0,64                                   |                                 | 48  | 25   |
| Bulgaria,BGR                 | 35   | 27,35  | 35,2               | 0,6                              | 0,5                              |                                  |                       | -0,31                                  | 0,41                            | 83  | 66   |
| Burkina Faso,BFA             | 16   | 86,66  | 19,6               | -1                               | -1,1                             | 20,7                             | -20,3                 | -0,34                                  | 0,38                            | 86  | 140  |
| Burundi,BDI                  | 7  | 33,33  | 10,7               | -0,2                             | 1,8                              |                                  |                       | -1,17                                  |                                 | 153                                       | 153  |
| Cambodia,KHM                 | 26   | 34,09  | 53,6               | -1,2                             | -1,3                             | 14,2                             | -55,8                 | -1,04                                  | 0,24                            | 149                                       | 123  |
| Cameroon,CMR                 | 11   | 22,91  | 39,8               | -1                               | -1,1                             | 9,9                              | -73,7                 | -1,03                                  | 0,24                            | 148                                       | 121  |
| Canada,CAN                   | 9  | 2,54   | 38,2               | 0                                | 0                                |                                  |                       | 1,85                                   | 0,83                            | 13  | 15   |
| Cape Verde,CPV               | 3  | 100  | 22,3               | 1,8                              | 1,1                              | 9,4                              | -41,5                 | 0,91                                   |                                 | 39  |  |
| Central African Republic,CAF | 8  | 62,16  | 35,6               | -0,1                             | -0,1                             | 47,7                             | 1                     | -1,31                                  |                                 | 160                                       | 152  |
| Chad,TCD                     | 19   | 54,54  | 3,9                | -1,3                             | -2,4                             | 34,4                             | -41,9                 | -1,29                                  |                                 | 159                                       | 130  |
| Chile,CHL                    | 18   | 16,02  | 23,9               | 0,6                              | 1,8                              | 5                                | na                    | 1,26                                   | 0,7                             | 26  | 49   |
| China,CHN                    | 17   | 12,43  | 22,1               | 1,1                              | 0,8                              | 9,3                              | -60,9                 | -0,27                                  | 0,52                            | 81  | 65   |
| Colombia,COL                 | 14   | 1,94   | 52,7               | -0,4                             | 0                                | 8,8                              | -39,8                 | -0,29                                  | 0,41                            | 82  | 72   |
| Comoros,COM                  | 10   | 87,5   | 19,9               | -1,1                             | -1                               |                                  |                       | -0,64                                  |                                 | 116                                       | 134  |
| Costa Rica,CRI               | 28   | 39,79  | 54                 | 0,3                              | 1,1                              | 5                                | na                    | 0,71                                   | 0,69                            | 45  | 54   |

|                                | BIODIV:                                      |  | FAO FOREST DATA    |                                  |                                  | FOOD                             |                  | Corruption                             |                                 |   | GDP   |
|--------------------------------|--|--|--------------------|----------------------------------|----------------------------------|----------------------------------|------------------|--|---------------------------------|---|---|
|                                | % territory which is declared protected area | % protected area which is IUCN reported or IUCN not applicable | % land area (2015) | % annual change rate (1990-2015) | % annual change rate (2010-2015) | % undernourished 2015 (1 to 171) | Change 1990-2015 | World Bank Control of corruption index | WJP Absence of corruption index | World Bank Ranking (1= best; 172 = worst) | GDP per capita ranking (1 = highest; 153= lowest) |
| Côte D'Ivoire,CIV              | 23   | 94,07  | 32,7               | 0,1                              | 0                                | 13,3                             | 24,7             | -0,42                                  | 0,38                            | 95  | 117   |
| Croatia,HRV                    | 38   | 77,71  | 34,3               | 0,2                              | 0                                |                                  |                  | 0,20                                   | 0,57                            | 60  | 53  |
| Cuba,CUB                       | 12   | 6,23   | 30,1               | 1,8                              | 1,8                              | 5                                | na               | 0,07                                   |                                 | 66  |   |
| Cyprus,CYP                     | 18   | 81,82  | 18,7               | 0,3                              | 0                                |                                  |                  | 0,98                                   |                                 | 36  | 29  |
| Czech Republic,CZE             | 22   | 30,8   | 34,5               | 0,1                              | 0,1                              |                                  |                  | 0,39                                   | 0,68                            | 56  | 37  |
| Democratic Republic of Congo,  | 12,7   | 45   | 67,3               | -0,2                             | -0,2                             | 30,5                             | -29,6            | -1,25                                  |                                 | 155                                       | 147   |
| Denmark,DNK                    | 26   | 27,08  | 14,4               | 0,5                              | 0,8                              |                                  |                  | 2,23                                   | 0,96                            | 5   | 9   |
| Djibouti,DJI                   | 2  | 42,86  | 0,2                | 0                                | 0                                | 15,9                             | -78,8            | -0,58                                  |                                 | 109                                       | 111   |
| Dominican Republic,DOM         | 23   | 4,55   | 41                 | 2,4                              | 1,8                              | 12,3                             | -64,3            | -0,77                                  | 0,34                            | 130                                       | 68  |
| Ecuador,ECU                    | 20   | 100  | 50,5               | -0,6                             | -0,6                             |                                  |                  | -0,65                                  | 0,42                            | 118                                       | 71  |
| Egypt,EGY                      | 13   | 54   | 0,1                | 2                                | 0,8                              | 5                                | na               | -0,56                                  | 0,45                            | 106                                       | 96  |
| El Salvador,SLV                | 9  | 99,4   | 12,8               | -1,4                             | -1,6                             | 12,4                             | -23,8            | -0,43                                  | 0,42                            | 98  | 86  |
| Equatorial Guinea,GNQ          | 23   | 43,75  | 55,9               | -0,7                             | -0,7                             |                                  |                  | -1,83                                  |                                 | 172                                       | 44  |
| Eritrea,ERI                    | 5  | 25   | 15                 | -0,3                             | -0,3                             |                                  |                  | -1,34                                  |                                 | 162                                       |   |
| Estonia,EST                    | 20   | 63,42  | 52,7               | 0                                | 0                                |                                  |                  | 1,25                                   | 0,78                            | 27  | 38  |
| Ethiopia,ETH                   | 19   | 60,57  | 11,4               | -0,8                             | 0,3                              | 32                               | -57,2            | -0,41                                  | 0,44                            | 94  | 138   |
| Finland,FIN                    | 14,9   | 16,12  | 73,1               | 0,1                              | 0                                |                                  |                  | 2,28                                   | 0,92                            | 2   | 17  |
| France,FRA                     | 26   | 1,07   | 31                 | 0,7                              | 0,7                              |                                  |                  | 1,28                                   | 0,74                            | 25  | 22  |
| Gabon,GAB                      | 20,1   | 90,91  | 89,3               | 0,2                              | 0,9                              | 5                                | na               | -0,67                                  |                                 | 119                                       | 63  |
| Gambia,GMB                     | 4,1  | 33,33  | 48,8               | 0,4                              | 0,3                              | 5,3                              | -60,3            | -0,77                                  |                                 | 131                                       | 146   |
| Georgia,GEO                    | 8,3  | 2,25   | 40,6               | 0,1                              | 0                                | 7,4                              | -86,8            | 0,64                                   | 0,73                            | 49  | 95  |
| Germany,DEU                    | 37,7   | 26,46  | 32,8               | 0                                | 0                                |                                  |                  | 1,82                                   | 0,84                            | 14  | 18  |
| Ghana,GHA                      | 15,1   | 95,01  | 41                 | 0,3                              | 0,3                              | 5                                | na               | -0,18                                  | 0,41                            | 77  | 119   |
| Greece,GRC                     | 35   | 39,33  | 31,5               | 0,8                              | 0,8                              |                                  |                  | -0,13                                  | 0,55                            | 76  | 36  |
| Guadeloupe,GLP                 | 72,8   | 5,89   | 42,5               | -0,1                             | -0,1                             |                                  |                  |  |                                 |   |   |
| Guatemala,GTM                  | 31,7   | 27,41  | 33                 | -1,2                             | -1                               | 15,6                             | 4,7              | -0,71                                  | 0,34                            | 122                                       | 93  |
| Guinea,GIN                     | 30,7   | 98,4   |                    | -0,5                             | -0,6                             | 16,4                             | -29              | -0,97                                  |                                 | 143                                       | 144   |
| Guinea-Bissau,GNB              | 16,7   | 94,45  | 70,1               | -0,5                             | -0,5                             | 20,7                             | -10,5            | -1,43                                  |                                 | 166                                       | 141   |
| Haiti,HTI                      | 0,3  | 12,5   | 3,5                | -0,7                             | -0,8                             | 53,4                             | -12,6            | -1,26                                  |                                 | 156                                       | 129   |
| Honduras,HND                   | 28,4   | 62,13  | 41                 | -2,3                             | -2,4                             | 12,2                             | -47,1            | -0,57                                  | 0,36                            | 107                                       | 105   |
| Hong Kong,HKG                  | 41,9   | 63,46  |                    |                                  |                                  |                                  |                  | 1,67                                   | 0,85                            | 16  | 16  |
| Hungary,HUN                    | 22,6   | 72,33  | 22,7               | 0,6                              | 0,2                              |                                  |                  | 0,10                                   | 0,51                            | 65  | 52  |
| Iceland,ISL                    | 17,4   | 12,31  | 0,5                | 4,6                              | 2,9                              |                                  |                  | 1,95                                   |                                 | 9   | 11  |
| India,IND                      | 6  | 18,75  | 23,8               | 0,4                              | 0,3                              | 15,2                             | -36              | -0,38                                  | 0,44                            | 91  | 114   |
| Indonesia,IDN                  | 11,9   | 17,95  | 53                 | -1,1                             | -0,7                             | 7,6                              | -61,6            | -0,45                                  | 0,38                            | 102                                       | 98  |
| Iran (Islamic Republic Of),IRN | 8,6  | 31,9   | 5,8                | 0,7                              | 0                                | 5                                | na               | -0,61                                  | 0,48                            | 113                                       |   |
| Iraq,IRQ                       | 1,5  | 21,74  | 1,9                | 0,1                              | 0                                | 28,8                             | 189,7            | -1,37                                  |                                 | 164                                       | 80  |
| Ireland,IRL                    | 14,4   | 81   | 10,9               | 2                                | 0,8                              |                                  |                  | 1,64                                   |                                 | 17  | 5   |
| Israel,ISR                     | 19,9   | 60,07  | 7,6                | 0,9                              | 1,4                              |                                  |                  | 0,89                                   |                                 | 40  | 23  |
| Italy,ITA                      | 21,5   | 77,21  | 31,6               | 0,8                              | 0,6                              |                                  |                  | -0,05                                  | 0,6                             | 71  | 26  |
| Jamaica,JAM                    | 15,9   | 10   | 31                 | -0,1                             | -0,1                             | 8,1                              | -22,3            | -0,33                                  | 0,55                            | 85  | 79  |
| Japan,JPN                      | 19,4   | 1,2  | 68,5               | 0                                | 0                                |                                  |                  | 1,61                                   | 0,83                            | 18  | 24  |
| Jordan,JOR                     | 1,7  | 73,33  | 1,1                | 0                                | 0                                | 5                                | na               | 0,26                                   | 0,66                            | 59  | 81  |
| Kazakhstan,KAZ                 | 3,3  | 33,02  | 1,2                | -0,1                             | 0                                | 5                                | na               | -0,76                                  | 0,43                            | 126                                       | 55  |

|                               | BIODIV: protected                            |  | FAO FOREST DATA    |                                  |                                  | FOOD                             |                    | Corruption                             |                                 |  | GDP per capita ranking (1 = highest; 153 = lowest) |
|-------------------------------|--|--|--------------------|----------------------------------|----------------------------------|----------------------------------|--------------------|--|---------------------------------|--|--|
|                               | % territory which is declared protected area | % protected area which is IUCN reported or IUCN not applicable | % land area (2015) | % annual change rate (1990-2015) | % annual change rate (2010-2015) | % undernourished 2015 (1 to 171) | % Change 1990-2015 | World Bank Control of corruption index | WJP Absence of corruption index | World Bank Ranking (1 = best; 172 = worst) |  |
| Kenya,KEN                     | 12,4   | 86,41  | 7,8                | -0,3                             | 0,9                              | 21,2                             | -34,5              | -1,01                                  | 0,26                            | 147  | 118  |
| Laos                          | 16,7   | 36,36  | 81,3               | 0,2                              | 1                                | 18,5                             | -56,8              | -0,84                                  |                                 | 135  | 113  |
| Latvia,LVA                    | 18,2   | 38,33  | 54                 | 0,2                              | 0                                |                                  |                    | 0,40                                   |                                 | 54   | 47   |
| Lebanon,LBN                   | 2,6  | 91,17  | 13,4               | 0,2                              | 0,1                              | 5                                | na                 | -0,88                                  | 0,36                            | 139  | 64   |
| Lesotho,LSO                   | 0,3  | 75   | 1,6                | 0,8                              | 2,2                              | 11,2                             | -28                | 0,07                                   |                                 | 67   | 124  |
| Liberia,LBR                   | 2,5  | 100  | 43,4               | -0,7                             | -0,7                             | 31,9                             | 10                 | -0,61                                  | 0,26                            | 114  | 148  |
| Libya,LBY                     | 0,2  | 62,5   | 0,1                | 0                                | 0                                |                                  |                    | -1,69                                  |                                 | 171  |  |
| Lithuania,LTU                 | 16,9   | 58,37  | 34,8               | 0,5                              | 0,1                              |                                  |                    | 0,56                                   |                                 | 51   | 45   |
| Luxembourg,LUX                | 32,3   | 39,53  | 33,5               | 0                                | 0                                |                                  |                    | 2,12                                   |                                 | 8  | 1  |
| Macedonia,MKD                 | 9,7  | 3,84   | 39,6               | 0,4                              | 0                                |                                  |                    | -0,13                                  | 0,5                             | 75   | 83   |
| Madagascar,MDG                | 5,2  | 63,26  | 21,4               | -0,4                             | -0,1                             | 33                               | 21                 | -0,76                                  | 0,3                             | 127  | 149  |
| Malawi,MWI                    | 16,9   | 93,18  | 33,4               | -0,9                             | -0,6                             | 20,7                             | -53,7              | -0,76                                  | 0,36                            | 129  | 150  |
| Malaysia,MYS                  | 19,1   | 66,85  | 67,6               | 0                                | 0,1                              | 5                                | na                 | 0,28                                   | 0,61                            | 57   | 56   |
| Mali,MLI                      | 8,2  | 20   | 3,9                | -1,4                             | -1,6                             | 5                                | na                 | -0,65                                  |                                 | 117  | 133  |
| Malta,MLT                     | 23,8   | 36,78  | 1,1                | 0                                | 0                                |                                  |                    | 0,92                                   |                                 | 38   | 32   |
| Martinique,MTQ                | 69,1   | 0  | 45,8               | 0                                | 0                                |                                  |                    | 1,25                                   |                                 | 32   |  |
| Mauritania,MRT                | 6  | 77,78  | 0,2                | -2,4                             | -1,5                             | 5,6                              | -61,6              | -0,91                                  |                                 | 141  |  |
| Mauritius,MUS                 | 4,7  | 25   | 19,2               | -0,3                             | 0,1                              |                                  |                    | 0,40                                   |                                 | 55   | 58   |
| Mexico,MEX                    | 14,3   | 57,32  | 34                 | -0,2                             | -0,1                             | 5                                | na                 | -0,74                                  | 0,32                            | 125  | 61   |
| Mongolia,MNG                  | 17,4   | 16,82  | 8,1                | 0                                | -0,8                             | 20,5                             | -31,5              | -0,47                                  | 0,41                            | 103  | 90   |
| Montenegro,MNE                | 4,1  | 50   | 61,5               | 1,1                              | 0                                |                                  |                    | -0,09                                  |                                 | 72   | 69   |
| Morocco,MAR                   | 30,8   | 87,89  | 12,6               | 0,5                              | -0,1                             | 5                                | na                 | -0,25                                  | 0,54                            | 80   | 102  |
| Mozambique,MOZ                | 21,6   | 68   | 48,2               | -0,5                             | -0,5                             | 25,3                             | -54,9              | -0,79                                  |                                 | 133  | 145  |
| Namibia,NAM                   | 37,9   | 89,19  | 8,4                | -0,9                             | -1                               | 42,3                             | 18                 | 0,28                                   |                                 | 58   | 84   |
| Nepal,NPL                     | 23,6   | 34,69  | 25,4               | -1,1                             | 0                                | 7,8                              | -65,6              | -0,55                                  | 0,38                            | 105  | 132  |
| Netherlands,NLD               | 11,33  | 50,29  | 11,1               | 0,3                              | 0,2                              |                                  |                    | 1,89                                   | 0,88                            | 11   | 12   |
| New Caledonia,NCL             | 54,4   | 41,33  | 45,9               | 0                                | 0                                |                                  |                    |  |                                 |  |  |
| New Zealand,NZL               | 32,5   | 4,32   | 38,6               | 0,2                              | 0                                |                                  |                    | 2,29                                   | 0,9                             | 1  | 21   |
| Nicaragua,NIC                 | 37,2   | 45,27  | 25,9               | -1,5                             | 0                                | 16,6                             | -69,5              | -0,87                                  | 0,37                            | 137  | 110  |
| Niger,NER                     | 17,3   | 66,67  | 0,9                | -2,1                             | -1,1                             | 9,5                              | -65,9              | -0,58                                  |                                 | 110  | 151  |
| Nigeria,NGA                   | 13,9   | 97,3   | 7,7                | -3,5                             | -5                               | 7                                | -67                | -1,10                                  | 0,3                             | 151  | 104  |
| Norway,NOR                    | 17   | 2,25   | 39,8               | 0                                | 0                                |                                  |                    | 2,26                                   | 0,92                            | 3  | 3  |
| Oman,OMN                      | 2,6  | 6,25   | 0                  | 0                                | 0                                | 5                                | na                 | 0,20                                   |                                 | 61   | 41   |
| Pakistan,PAK                  | 12,3   | 57,3   | 1,9                | -2,1                             | -2,7                             | 22                               | -12,4              | -0,76                                  | 0,33                            | 128  | 115  |
| Panama,PAN                    | 20,9   | 75,79  | 62,1               | -0,4                             | -0,4                             | 9,5                              | -64,2              | -0,34                                  | 0,45                            | 87   | 50   |
| Papua New Guinea,PNG          | 3,1  | 91,55  | 72,5               | 0                                | 0                                |                                  |                    | -0,99                                  |                                 | 145  |  |
| Paraguay,PRY                  | 6,5  | 36,37  | 38,6               | -1,3                             | -2                               | 10,4                             | -46,6              | -0,94                                  |                                 | 142  | 89   |
| Peru,PER                      | 21,3   | 3,28   | 57,8               | -0,2                             | -0,2                             | 7,5                              | -76,2              | -0,60                                  | 0,36                            | 112  | 73   |
| Philippines,PHL               | 15,3   | 30,23  | 27                 | 0,8                              | 3,3                              | 13,5                             | -48,8              | -0,43                                  | 0,48                            | 96   | 101  |
| Poland,POL                    | 39,6   | 33,74  | 30,8               | 0,2                              | 0,2                              | 14,6                             |                    | 0,58                                   | 0,73                            | 50   | 51   |
| Portugal,PRT                  | 20,3   | 49,89  | 35,3               | -0,3                             | -0,4                             |                                  |                    | 0,92                                   | 0,72                            | 37   | 35   |
| Puerto Rico,PRI               | 7,4  | 6,02   | 57,9               | 2,2                              | 0,7                              |                                  |                    | 0,13                                   |                                 | 64   |  |
| Qatar,QAT                     | 2,4  | 80   |                    |                                  |                                  |                                  |                    | 0,98                                   |                                 | 34   | 4  |
| Republic of Congo,COG (Brazza | 40,6   | 65,63  | 65,4               | -0,1                             | -0,1                             | 30,5                             | -29,6              | -1,22                                  |                                 | 154  | 112  |

|                              | BIODIV: protected                            |  | FAO FOREST DATA    |                                  |                                  | FOOD                             |                    | Corruption                             |                                 |  | GDP per capita ranking (1 = highest; 153 = lowest) |
|------------------------------|--|--|--------------------|----------------------------------|----------------------------------|----------------------------------|--------------------|--|---------------------------------|--|--|
|                              | % territory which is declared protected area | % protected area which is IUCN reported or IUCN not applicable | % land area (2015) | % annual change rate (1990-2015) | % annual change rate (2010-2015) | % undernourished 2015 (1 to 171) | % Change 1990-2015 | World Bank Control of corruption index | WJP Absence of corruption index | World Bank Ranking (1 = best; 172 = worst) |  |
| Republic Of Korea, KOR (sth) | 11,2   | 1,83   | 63,7               | -0,1                             | -0,1                             | 5                                | na                 | 0,49                                   | 0,65                            | 52   | 27   |
| Republic of Kosovo,KOS       | 10,9   | 0  |                    |                                  |                                  |                                  |                    | -0,52                                  |                                 | 104  |  |
| Republic of Moldova,MDA      | 4,2  | 4,5  | 12,4               | 1                                | 1,2                              |                                  |                    | -0,88                                  | 0,28                            | 140  |  |
| Russian Federation,RUS       | 9,7  | 3,83   | 49,8               | 0                                | 0                                |                                  |                    | -0,86                                  | 0,41                            | 136  | 60   |
| Rwanda,RWA                   | 9,1  | 50   | 19,5               | 1,7                              | 1,5                              | 31,6                             | -43,1              | 0,67                                   |                                 | 46   | 136  |
| Saudi Arabia,SAU             | 4,3  | 80,16  | 0,5                | 0                                | 0                                | 5                                | na                 | 0,06                                   |                                 | 68   | 34   |
| Senegal,SEN                  | 25,2   | 89,52  | 43                 | -0,5                             | -0,5                             | 24,6                             | 0,1                | 0,03                                   | 0,55                            | 69   | 127  |
| Serbia,SRB                   | 6,1  | 37,5   | 31,1               | 0,7                              | 0,1                              |                                  |                    | -0,24                                  | 0,41                            | 79   | 78   |
| Seychelles,SYC               | 42,1   | 24   | 88,4               | 0                                | 0                                |                                  |                    | 0,89                                   |                                 | 41   | 42   |
| Sierra Leone,SLE             | 9,4  | 86   | 42,5               | -0,1                             | 2,2                              | 22,3                             | -47,9              | -0,78                                  | 0,3                             | 132  | 137  |
| Singapore,SGP                | 5,6  | 0  | 23,4               | 0                                | 0                                |                                  |                    | 2,13                                   | 0,93                            | 7  | 8  |
| Slovakia,SVK                 | 37,3   | 35,15  | 40,3               | 0                                | 0                                |                                  |                    | 0,15                                   |                                 | 63   | 39   |
| Slovenia,SVN                 | 53,6   | 0,17   | 62                 | 0,2                              | 0                                |                                  |                    | 0,73                                   | 0,6                             | 44   | 33   |
| Somalia,SOM                  | 0,8  | 100  | 10,1               | -1                               | -1,2                             |                                  |                    | -1,62                                  |                                 | 170  | 143  |
| South Africa,ZAF             | 14,1   | 100  | 7,6                | 0                                | 0                                | 5                                | na                 | -0,04                                  | 0,55                            | 70   | 76   |
| Spain,ESP                    | 28   | 74,79  | 36,9               | 1,2                              | 0,2                              |                                  |                    | 0,49                                   | 0,69                            | 53   | 28   |
| Sri Lanka,LKA                | 29,9   | 20   | 33                 | -0,4                             | -0,3                             | 22                               | -28,3              | -0,37                                  | 0,45                            | 89   | 92   |
| Sudan,SDN                    | 2,3  | 69,56  | 10,3               | -0,8                             | -0,9                             | na                               | na                 | -1,50                                  |                                 | 168  | 106  |
| Suriname,SUR                 | 14,5   | 36,37  | 95,4               | 0                                | 0                                |                                  |                    | -0,57                                  | 0,56                            | 108  | 57   |
| Swaziland,SWZ                | 4,1  | 13,04  | 34,1               | 0,9                              | 0,8                              | 26,8                             | 68,6               | -0,32                                  |                                 | 84   | 99   |
| Sweden,SWE                   | 14,5   | 74,39  | 68,4               | 0                                | 0                                |                                  |                    | 2,25                                   | 0,91                            | 4  | 10   |
| Switzerland,CHE              | 9,7  | 0,27   | 31,4               | 0,3                              | 0,3                              |                                  |                    | 2,17                                   |                                 | 6  | 2  |
| Syrian Arab Republic,SYR     | 0,7  | 100  | 2,7                | 1,1                              | 0                                |                                  |                    | -1,53                                  |                                 | 169  |  |
| Taiwan                       | 19,7   | 1,09   |                    |                                  |                                  |                                  |                    | 0,80                                   |                                 | 43   |  |
| Tajikistan,TJK               | 22,3   | 23,08  | 3                  | 0                                | 0,1                              | 33,2                             | 18,2               | -1,00                                  |                                 | 146  | 125  |
| Tanzania,TZA                 | 38,1   | 88,82  | 52                 | -0,8                             | -0,8                             | 32,1                             | 32,9               | -0,72                                  | 0,39                            | 124  | 128  |
| Thailand,THA                 | 18,8   | 8,4  | 32,1               | 0,6                              | 0,2                              | 7,4                              | -78,7              | -0,40                                  | 0,47                            | 92   | 74   |
| Togo,TGO                     | 27,6   | 89,13  | 3,5                | -5                               | -8,1                             | 11,4                             | -69,9              | -0,71                                  |                                 | 123  | 142  |
| Tunisia,TUN                  | 5,4  | 90,19  | 6,7                | 1,9                              | 1                                | 5                                | na                 | -0,11                                  | 0,47                            | 73   | 94   |
| Turkey,TUR                   | 5,3  | 100  | 15,2               | 0,8                              | 0,9                              | 5                                | na                 | -0,11                                  | 0,48                            | 74   | 59   |
| Turkmenistan,TKM             | 3,2  | 50,01  | 8,8                | 0                                | 0                                | 5                                | na                 | -1,26                                  |                                 | 157  | 67   |
| Uganda,UGA                   | 16,1   | 95,08  | 10,4               | -3,3                             | -5,5                             | 25,5                             | 10,1               | -1,05                                  | 0,27                            | 150  | 135  |
| Ukraine,UKR                  | 4  | 1,41   | 16,7               | 0,2                              | 0,2                              |                                  |                    | -0,98                                  | 0,36                            | 144  | 108  |
| United Arab Emirates,ARE     | 13,1   | 100  | 3,9                | 1,1                              | 0,3                              | 5                                | na                 | 1,12                                   | 0,8                             | 33   | 19   |
| United Kingdom GBR           | 28,2   | 13,39  | 13                 | 0,5                              | 0,5                              |                                  |                    | 1,87                                   | 0,82                            | 12   | 13   |
| United States America,USA    | 13   | 2,08   | 33,8               | 0,1                              | 0,1                              |                                  |                    | 1,38                                   | 0,73                            | 21   | 7  |
| Uruguay,URY                  | 3,5  | 43,33  | 10,5               | 3,4                              | 1,3                              | 5                                | na                 | 1,30                                   | 0,77                            | 23   | 40   |
| Uzbekistan,UZB               | 3,4  | 27,78  | 7,3                | 0,2                              | -0,3                             | 5                                | na                 | -1,16                                  | 0,33                            | 152  | 107  |
| Venezuela ,VEN               | 54,1   | 25,5   | 52,9               | -0,4                             | -0,3                             | 5                                | na                 | -1,33                                  | 0,25                            | 161  |  |
| Viet Nam,VNM                 | 7,6  | 58,65  | 47,6               | 1,8                              | 0,9                              | 11                               | -75,8              | -0,45                                  | 0,45                            | 100  | 109  |
| Yemen,YEM                    | 0,8  | 100  | 1                  | 0                                | 0                                | 26,1                             | -9,7               | -1,45                                  |                                 | 167  | 116  |
| Zambia,ZMB                   | 38   | 88,66  | 65,4               | -0,3                             | -0,3                             | 47,8                             | 41,4               | -0,41                                  | 0,4                             | 93   | 120  |
| Zimbabwe,ZWE                 | 27,2   | 72,84  | 36,4               | -1,8                             | -2,1                             | 33,4                             | -21,9              | -1,29                                  | 0,29                            | 158  | 126  |

## 4.4 Country specific case studies

The rationale of the various approaches to compare the situation in the various countries (based on combining indicators, or ranking over a smaller number of indicators or a combination of both) is to overcome some of the limits of the indicator methodologies studies (which are very data intensive and include difficult to quantify features, cf. above) by a three-step approach:

- (1) use the indicators to monitor alarming situations: focus on the countries where the indicators unambiguously signal a major concern
- (2) whenever such an alarming situation is observed, check the data of the databases with a second source of information (as we have chosen widely used indicators, such a second source is mostly available in the specific country reports or in journal articles)
- (3) when the data is confirmed, conduct in depth analysis in these countries to better understand the causes and the measures to be taken

For the purpose of building a methodology on the monitoring of the import of and investment in biomass or biomass based products in Belgium, this implies to (1) double checking the data for the list of highly worrisome situations in the results reported in the final indicators' table and (2) conduct short focused assessments for highly worrisome countries where Belgian actors develop activities. Below, we give some additional data on three countries, showing that focused country specific research confirms the lessons learned from the analysis of the selected indicators.

### **Indonesia**

Governance indicator with major concern: forest

Sources consulted for further focused country analysis:

- FAO Global Forest Resources Assessment, 2015
- Poffenberg, M. 1997. Rethinking Indonesian Forest Policy, Asian Survey, Vol. 37(5): 453-469.
- Warodojo and Masripatin, 2002. Policy Trend Report. Ministry of Forestry, Indonesia.
- The dark side of green growth. Human Rights Impacts of Weak Governance in Indonesia's Forestry sector. July 2013.

Indonesia lost, in the decade 2000-2010 every year an additional 0,5% of its total forest area, and between 2010-2015 this trend even worsened to an annual rate of 0,7%, which indicates a very bad state of the forest policy in the country. As a result of the yearly deforestation, Indonesia has lost 23% of all its forest between 1990 and 2015.

Even for the most valuable, biodiversity rich forests, this degradation of the trend in forest loss can be observed. Indonesia is losing 0,5% per year of its primary forest, without any change in this trend over the last 15years. As a result the primary forest with an area of 49453 ha in 2000 has lost 7% (3429 ha) when measured over a 15 years period (till 2015).

An analysis of the forest policy indicators shows that

- There are no forest policy and regulatory frameworks that support sustainable forest management in private forests.
- Private forest ownership is 13% and public 87%. However, decay in forest area shows exactly the same trend in forest under private and forest under public ownership.

An analysis in 1997 by Poffenberg, already indicated that from a social and environmental standpoint, Indonesia's timber operations have been a disaster, bearing a legacy that the nation will carry well into the 21st century. This is reflected in the growing tensions between the Ministry of Forestry (MOF) and the political and economic powers that dominate the industry, and by the increasingly vocal concerns of local and provincial governments that must deal with the problems stemming from forest exploitation policies. In addition, the scattered but expanding incidence of social unrest among forest communities in the Outer Islands, which stem from the inequitable allocation of forest use rights, poses a further threat to the continuation of the industry as it is presently structured.

More recently, the Forest Ministry itself, indicated that the sector has developed from a largely non-commercial operation into one of the most important components of the economy, supporting national development and foreign exchange earnings in the three decades since the early seventies. However, according to the Ministry (Warodojo and Masripatin, 2002), rapid development of timber-based industries on the one hand and a lack of effort in securing regeneration of logged-over areas on the other, has resulted in forest degradation in many parts of Indonesia's major islands, where commercial timber trees are available. Changes in land use policy to accommodate human resettlement, agriculture and the development of estate crop plantations, which for the most part have been short-lived, have also contributed to deforestation and land degradation. Furthermore, forest fires, illegal logging and the subsequent illicit trade have become major issues which need to be addressed not only by the forestry sector itself, but also by related parties at various levels"

### **Bosnia Herzegovina**

Governance indicator with major concern: protected areas

Sources consulted for further focused country analysis

- Environmental performance review, Bosnia and Herzegovina, 2011 (United Nations, Geneva).

Environmental management has not been a priority in the post-war economic recovery process in Bosnia and Herzegovina and environmental management throughout the country suffers from suboptimal institutional, policy and legal frameworks. Consequently, policies, plans and programmes fail to take into account environmental impacts.

The lack of an environmental mandate, authority and capacity at the State level and continuing opposition to any increase in power at the State level contributes to many problems, especially a lack of policy coherence between the State and the entities.

The lack of a State environment law continues to exacerbate a number of problems, such as the scattering of the competencies for environmental legislation and administration over all administrative levels. Because of weak inter-entity coordination mechanisms, legislative and administrative procedures are slow and redundant. Law-making activities at the State level are not based on clear and coordinated policies and priorities. Poor coordination with other sectors in turn leads to limited attention to environmental considerations in those domains.

Specifically in relation to biodiversity policies, the Environmental performance review mentions (1) a lack of an integrated information system on biodiversity objectives; (2) an ineffective institutional framework (which is a major obstacle to the decision-making process and implementation at the international level); (3) lack of cooperation between the relevant institutions; and (4) an uneven level of implementation of international agreements and EU directives.

According to the review, the protected area coverage is even lower than indicated in the IUCN database: 0,84% of the national territory (p. 56 of the Environmental Performance Review).

## Guatemala

Governance indicator with major concern: food security

Sources consulted for further focused country analysis

- Isakson, S.R., 2013. Maize Diversity and the Political Economy of Agrarian Restructuring in Guatemala, *Journal of Agrarian Change*.
- Oxfam, the struggle for a pro poor food policy agenda, Guatemala.
- 

In Guatemala, less than 8 per cent of agricultural producers hold almost 80 per cent of land. A tiny elite profits from selling cash crops for export and local consumption. This concentration is compounded by years of underinvestment in the small-scale farming sector, the dismantling over previous years of many of the institutions set up to support agricultural development, and the historical and ongoing forced relocation of many indigenous Guatemalans to marginal and unproductive lands.

In spite of this situation, Guatemala, has seen 87,000 hectare of land change hands between 2000 and 2011 despite high levels of hunger and malnutrition in rural areas. Major land acquisitions have occurred by companies from the US, Spain and Mexico (cf. [landmatrix.org](http://landmatrix.org)) and these land acquisitions mainly concerned food crops (in particular maize).

While the best lands are reserved for plantations producing sugar-cane, coffee, bananas, pineapples, and – increasingly – **biofuels for export**, small-scale Guatemalan farmers remain highly vulnerable to the impacts of shocks on their production, as evidenced by the 2009 crop failures which affected hundreds of thousands of farmers.

More specifically related to biodiversity, policies have undermined maize agriculture and contributed to the loss of crop genetic resources in the Guatemalan ‘megacentre’ of agricultural biodiversity (Isakson, 2013). In its place, small-scale farmers have been encouraged to conform to the country's purported comparative advantage in non-traditional export crops. The results have been widening inequality, a growing dependence upon imported grain and agrochemicals, environmental degradation and decreased food security.

## 5 Use of the indicators

The main use of the indicator is for awareness raising amongst various stakeholder categories. Private sector users might use the governance indicator to match the list of source countries of their biomass activities with the available data on governance. Whenever the governance in the source country is a concern, the company should indicate the special steps undertaken to guarantee the sustainable sourcing, for instance through the development of a special sector specific certification procedure (in line with some of the WWF initiatives such as the Common Wild Capture Fishery Methodology<sup>1</sup>). Private non-profit users of the indicators can use the governance data as a basis for developing more in depth case study analysis of countries where both a high level of concern is observed and where Belgian economic actors undertake major biomass related activities. Public sector users finally can widely communicate about the results of the indicator process, as a way trigger additional data gathering with the view to complete missing data and increase the overall quality of the awareness raising processes.

With the view to such use, it seems relevant to look for a country per country intuitive presentation of the results. The website with the indicators could build a country per country fact sheet that can easily be understood. To further the reflection on this issue, we have test run a series of possible single country presentations. The advantage of such a tool is that it can be embedded in the website and “pop-up” when highlighting a certain country. At the present stage we included the GDP data in the test run. Indeed, it is an interesting control variable (as it is often used in international discussions), but it might be decided in a later stage not to include it based on a more in depth study on the presence or absence of correlations between GDP data and the biodiversity policy governance sub-indicators identified in this preliminary report.

A first attempt was based on diagrams that use the exact numerical amounts of the database. However the resulting diagrams are difficult to read, as the scales of the indicators such as for instance GDP (between 300 and 101000) as compared to the governance indicators (between -1,38 and 2,25) are totally different. In a second attempt we did a “re-scaling” of all the data to a common scale between 0 and 100, but this did not lead to a clear presentation neither. Indeed, for some data the variability between the extremes is very big, but for others there is only a small variability around an average value (but in the latter case such variations can have a major impact on understanding of governance)<sup>2</sup>. A third option, which we present below, is to represent the countries on a radar diagram with their relative ranking on each of the indicators as compared to the other countries. We calculated this ranking for all the countries and present below how this presentation can look like.

All source data of the radar diagram is given in annex 2.

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1

[https://www.google.be/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=0ahUKewiujo\\_DfbLAhXDuhokHTBPBr4QFggiMAE&url=http%3A%2F%2Fassets.panda.org%2Fdownloads%2Fcommon\\_wildcapture\\_methodology\\_questionnaire.pdf&usg=AFQjCNGoTHFpAfgQw-MCmluKAGhPGI0ong](https://www.google.be/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=0ahUKewiujo_DfbLAhXDuhokHTBPBr4QFggiMAE&url=http%3A%2F%2Fassets.panda.org%2Fdownloads%2Fcommon_wildcapture_methodology_questionnaire.pdf&usg=AFQjCNGoTHFpAfgQw-MCmluKAGhPGI0ong)

<sup>2</sup> Another test that could be made for building “readable” radar diagrams is a logarithmic transformation of the data.



**Detailed Radar diagram Indonesia**

Country ranking for the 4 governance indicators + the control variable (GDP) as compared to the worst country situation in the database (in grey) and the best country situation in the database (in orange).

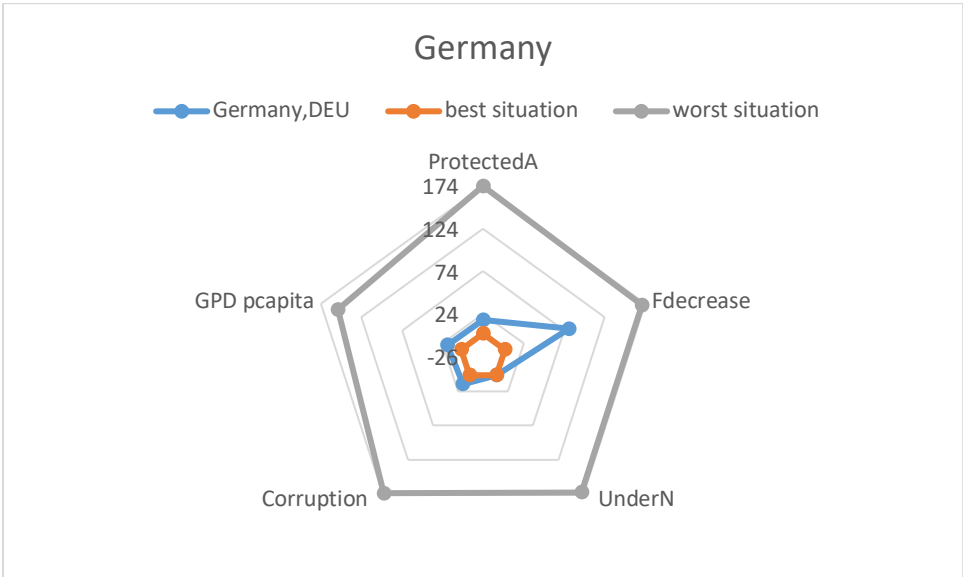
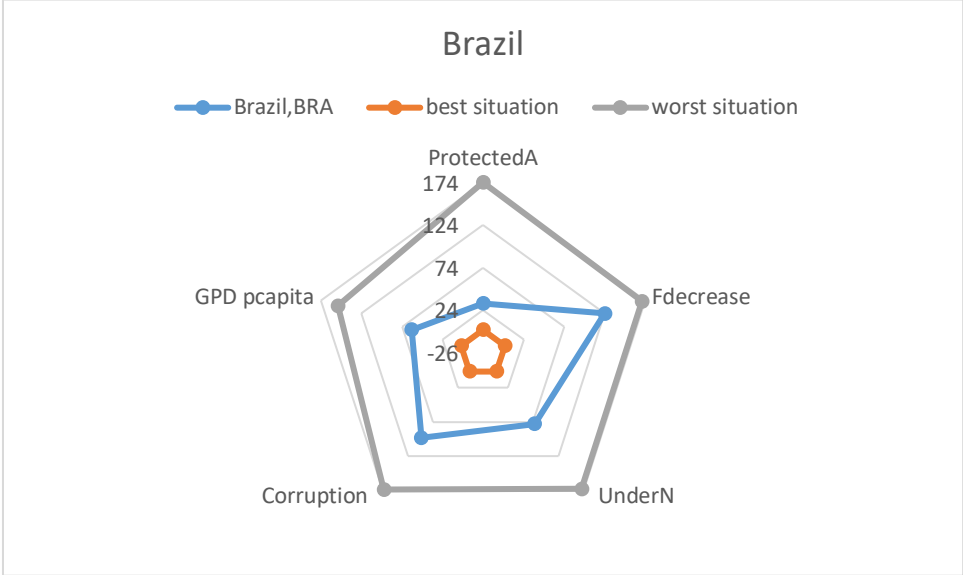
|             | best situation (in orange in the radar diagram) | Total number of countries with data (the country with this number is also the worst situation : in grey on the radar diagram) | Ranking of Indonesia (in blue) | Variation from best to worst in the database            |
|-------------|---|---|--------------------------------|---|
| ProtectedA  | 1   | 174   | 105                            | 72% PA coverage to 0,1% coverage                        |
| Fdecrease   | 1   | 170   | 143                            | 3,3% forest increase to 8,1 forest decrease             |
| UnderN      | 1   | 171   | 113                            | No UnderN to 53,4% underN                               |
| Corruption  | 1   | 172   | 102                            |   |
| GPD pcapita | 1   | 153   | 98                             | 277 USD per capita to 101000 USD per capita (2015 data) |



**Legend:** the numbers in the diagram indicate the ranking of the country on a given indicator from “1” (best comparative performance) to “174” (worst comparative performance). The best situation is indicated in “orange” (PS : the figure “- 26” has no meaning, but was added by the software and can be easily deleted).

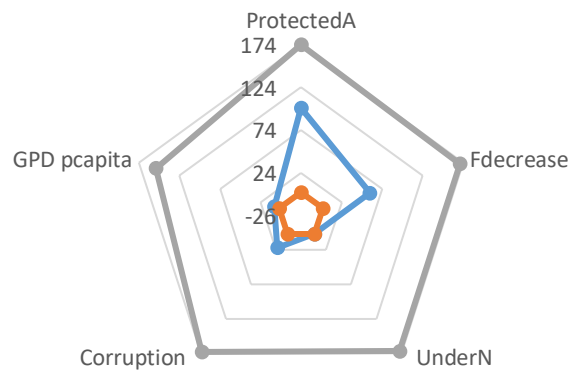
**Illustration with other radar diagrams (all the source data: in Annex 2).**

**Legend:** as above, the numbers in the diagram indicate the ranking of the country on a given indicator from “1” (best comparative performance) to “174” (worst comparative performance). The best situation is indicated in “orange” (PS : the figure “- 26” has no meaning, but was added by the software and can be easily deleted).



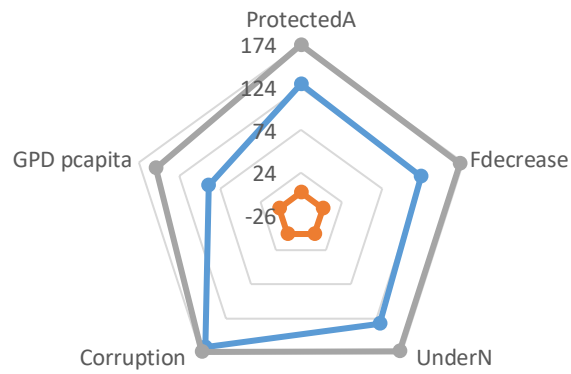
### United States of America

United States America,USA    best situation    worst situation



### Angola

Angola,AGO    best situation    worst situation



## 6 Conclusion

The report on the building of a governance indicator has provided some guidelines that can be used in more in depth study for the development of the governance indicator. The short in depth country analyses confirm that the countries that are identified as “worrisome” through the different proposed methodologies (worst countries analysis, analysis of the top, middle and bottom terciles and radar diagrams) are indeed in a situation of dramatic unsustainable development that is already caused by or might be further worsened by biomass related activities.

Next steps for the operationalisation of the indicators identified in the report are

- (1) In depth case study analysis of the a broad range of countries, to provide more in depth information on the causes and mechanisms of the unsustainability situations in the analysed countries
- (2) In depth case study analysis for countries where Belgian companies develop major biomass based investment
- (3) Further analyse the best way to present the single country situation in the proposed radar diagrams
- (4) Development of software that can produce the various radar diagrams for all the countries

All data was “hand coded” in the present report. In a more finalized version of this project however an automatic link can probably be made between the source data of the selected indicators and the web based presentation of the tool. In such case, the project could also include a communication interface to flag possible concerns with the source data of the consulted IUCN, FAO and World Bank databases, each time that a data inconsistency or lacking data is observed.

Various other items for further improvement of the initial framework proposed in this report have been discussed during the meetings:

- (1) To further refine the methodology, it is useful to have both a static indicator (status in a certain year) and a progress indicator (progress over a time period) for all the features analysed. In particular, for the protected areas such an indicator could be added. However, as far as we know, such a progress indicator has not been calculated at present in the international reporting tools under the CBD. A possible tool for building the indicator is a comparison of the yearly or bi-yearly reports by major international organisation, which are available on line and often contain a table with the status indicator of the protected area coverage per country. For the OECD these data are directly available (through the OECD environmental data compendium for example). However, for the CBD and the IUCN past reports concern individual country reports, but not a summary overview of all the country data. The platform “Protected Planet” ([www.protectedplanet.net](http://www.protectedplanet.net)) only contains a status indicator and no information on the temporal evolution. Further research is therefore needed to build such a progress indicator.
- (2) A comparison can be made between two means of calculating the forest policy sub-indicator. The first is the one used as an illustration in this report (based on the global trend in change in forested land over the last 25 years and over the last 5 years). Another potentially interesting approach is to construct a sub-indicator based on the data for trends on primary forest and trends on naturally generated forest in these same countries

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## Annex 1. An illustration focusing on worst case situations

|                           | BIODIV: protected areas                      |   | FAO FOREST DATA    |                                  |                                  | FOOD INSECURITY       |                    | Corruption                             |                                 |
|---------------------------|--|---|--------------------|----------------------------------|----------------------------------|-----------------------|--------------------|--|---------------------------------|
|                           | % territory which is declared protected area | % of declared protected area which is IUCN not reported or IUCN not | % land area (2015) | % annual change rate (1990-2015) | % annual change rate (2010-2015) | % undernourished 2015 | % Change 1990-2015 | World Bank Control of corruption index | WJP Absence of corruption index |
| Afghanistan,AFG           | 0  | 46,15   | 2,1                | 0                                | 0                                | 26,8                  | -9                 | -1,34                                  | 0,23                            |
| Albania,ALB               | 17   | 6,9   | 28,2               | -0,1                             | -0,1                             |                       |                    | -0,44                                  | 0,33                            |
| Algeria,DZA               | 8  | 78,95   | 0,8                | 0,6                              | 0,4                              | 5                     | na                 | -0,68                                  |                                 |
| American Samoa,ASM        | 4  | 0   | 87,7               | -0,2                             | -0,2                             | 5                     | na                 | 1,25                                   |                                 |
| Andorra,AND               | 21   | 100   | 34                 | 0                                | 0                                |                       |                    | 1,25                                   |                                 |
| Angola,AGO                | 7  | 7,14  | 46,4               | -0,2                             | -0,2                             | 14,2                  | -77,6              | -1,40                                  |                                 |
| Anguilla,AIA              | 6  | 100   | 61,1               | 0                                | 0                                |                       |                    | 1,25                                   |                                 |
| Antigua and Barbuda,AT    | 19   | 56,25   | 22,3               | -0,2                             | 0                                |                       |                    | 0,67                                   | 0,66                            |
| Argentina,ARG             | 9  | 16,89   | 9,9                | -1                               | -1,1                             | 5                     | na                 | -0,59                                  | 0,51                            |
| Armenia,ARM               | 23   | 8,57  | 11,8               | 0                                | 0,1                              | 5,8                   | -78,8              | -0,45                                  |                                 |
| Aruba,ABW                 | 1  | 100   | 2,3                | 0                                | 0                                |                       |                    | 1,31                                   |                                 |
| Australia,AUS             | 17   | 0,88  | 16,2               | -0,1                             | 0,2                              |                       |                    | 1,91                                   | 0,83                            |
| Austria,AUT               | 28   | 23,6  | 46,9               | 0,1                              | 0                                |                       |                    | 1,49                                   | 0,84                            |
| Azerbaijan,AZE            | 10   | 8,11  | 13,8               | 1,2                              | 2,5                              | 5                     | na                 | -0,82                                  |                                 |
| Bahamas,BHS               | 31   | 72,41   | 51,4               | 0                                | 0                                |                       |                    | 1,29                                   | 0,64                            |
| Bahrain,BHR               | 7  | 75  | 0,8                | 4,2                              | 2,8                              |                       |                    | 0,17                                   |                                 |
| Bangladesh,BGD            | 5  | 27,45   | 11                 | -0,2                             | -0,2                             | 16,4                  | -49,9              | -0,88                                  | 0,34                            |
| Barbados,BRB              | 1  | 22,22   | 14,7               | 0                                | 0                                | 5                     | na                 | 1,79                                   | 0,7                             |
| Belarus,BLR               | 9  | 4,15  | 41,6               | 0,4                              | 0,2                              |                       |                    | -0,37                                  | 0,52                            |
| Belgium,BEL               | 23   | 49,04   | 22,6               | 0                                | 0,1                              |                       |                    | 1,58                                   | 0,78                            |
| Belize,BLZ                | 38   | 7,76  | 59,9               | -0,7                             | -0,4                             | 6,2                   | -36,2              | -0,21                                  | 0,48                            |
| Benin,BEN                 | 29   | 91,38   | 39                 | -1,2                             | -1,1                             | 7,5                   | -73,4              | -0,61                                  |                                 |
| Bermuda,BMU               | 6  | 29,58   | 20                 | 0                                | 0                                |                       |                    | 1,25                                   |                                 |
| Bhutan,BTN                | 48   | 10  | 72,3               | 0,4                              | 0,4                              |                       |                    | 0,98                                   |                                 |
| Bolivia ,BOL              | 31   | 97,01   | 50,6               | -0,5                             | -0,5                             | 15,9                  | -58,1              | -0,68                                  | 0,29                            |
| Bosnia and Herzegovina,   | 2  | 48,57   | 42,8               | 0                                | 0                                |                       |                    | -0,37                                  | 0,43                            |
| Botswana,BWA              | 29   | 9   | 19,1               | -0,9                             | -0,9                             | 24,1                  | -4,1               | 0,84                                   | 0,62                            |
| Brazil,BRA                | 29   | 50,16   | 59                 | -0,4                             | -0,2                             | 5                     | na                 | -0,43                                  | 0,45                            |
| Brunei Darussalam,BRN     | 47   | 35,71   | 72,1               | -0,3                             | 0                                | 5                     | na                 | 0,64                                   |                                 |
| Bulgaria,BGR              | 35   | 27,35   | 35,2               | 0,6                              | 0,5                              |                       |                    | -0,31                                  | 0,41                            |
| Burkina Faso,BFA          | 16   | 86,66   | 19,6               | -1                               | -1,1                             | 20,7                  | -20,3              | -0,34                                  | 0,38                            |
| Burundi,BDI               | 7  | 33,33   | 10,7               | -0,2                             | 1,8                              |                       |                    | -1,17                                  |                                 |
| Cambodia,KHM              | 26   | 34,09   | 53,6               | -1,2                             | -1,3                             | 14,2                  | -55,8              | -1,04                                  | 0,24                            |
| Cameroon,CMR              | 11   | 22,91   | 39,8               | -1                               | -1,1                             | 9,9                   | -73,7              | -1,03                                  | 0,24                            |
| Canada,CAN                | 9  | 2,54  | 38,2               | 0                                | 0                                |                       |                    | 1,85                                   | 0,83                            |
| Cape Verde,CPV            | 3  | 100   | 22,3               | 1,8                              | 1,1                              | 9,4                   | -41,5              | 0,91                                   |                                 |
| Central African Republic, | 8  | 62,16   | 35,6               | -0,1                             | -0,1                             | 47,7                  | 1                  | -1,31                                  |                                 |
| Chad,TCD                  | 19   | 54,54   | 3,9                | -1,3                             | -2,4                             | 34,4                  | -41,9              | -1,29                                  |                                 |
| Chile,CHL                 | 18   | 16,02   | 23,9               | 0,6                              | 1,8                              | 5                     | na                 | 1,26                                   | 0,7                             |
| China,CHN                 | 17   | 12,43   | 22,1               | 1,1                              | 0,8                              | 9,3                   | -60,9              | -0,27                                  | 0,52                            |
| Colombia,COL              | 14   | 1,94  | 52,7               | -0,4                             | 0                                | 8,8                   | -39,8              | -0,29                                  | 0,41                            |
| Comoros,COM               | 10   | 87,5  | 19,9               | -1,1                             | -1                               |                       |                    | -0,64                                  |                                 |
| Costa Rica,CRI            | 28   | 39,79   | 54                 | 0,3                              | 1,1                              | 5                     | na                 | 0,71                                   | 0,69                            |
| Côte D'Ivoire,CIV         | 23   | 94,07   | 32,7               | 0,1                              | 0                                | 13,3                  | 24,7               | -0,42                                  | 0,38                            |
| Croatia,HRV               | 38   | 77,71   | 34,3               | 0,2                              | 0                                |                       |                    | 0,20                                   | 0,57                            |
| Cuba,CUB                  | 12   | 6,23  | 30,1               | 1,8                              | 1,8                              | 5                     | na                 | 0,07                                   |                                 |
| Cyprus,CYP                | 18   | 81,82   | 18,7               | 0,3                              | 0                                |                       |                    | 0,98                                   |                                 |
| Czech Republic,CZE        | 22   | 30,8  | 34,5               | 0,1                              | 0,1                              |                       |                    | 0,39                                   | 0,68                            |

|                           | BIODIV: protected areas                      |  | FAO FOREST DATA    |                                  |                                  | FOOD INSECURITY       |                    | Corruption                             |                                 |
|---------------------------|--|--|--------------------|----------------------------------|----------------------------------|-----------------------|--------------------|--|---------------------------------|
|                           | % territory which is declared protected area | % of declared protected area which is IUCN not reported or IUCN not applicable | % land area (2015) | % annual change rate (1990-2015) | % annual change rate (2010-2015) | % undernourished 2015 | % Change 1990-2015 | World Bank Control of corruption index | WJP Absence of corruption index |
| Democratic Republic of C  | 12,7   | 45   | 67,3               | -0,2                             | -0,2                             | 30,5                  | -29,6              | -1,25                                  |                                 |
| Denmark, DNK              | 26   | 27,08  | 14,4               | 0,5                              | 0,8                              |                       |                    | 2,23                                   | 0,96                            |
| Djibouti, DJI             | 2  | 42,86  | 0,2                | 0                                | 0                                | 15,9                  | -78,8              | -0,58                                  |                                 |
| Dominica DMA              |  |  | 57,8               | -0,6                             | -0,6                             |                       |                    | 0,62                                   | 0,65                            |
| Dominican Republic, DOM   | 23   | 4,55   | 41                 | 2,4                              | 1,8                              | 12,3                  | -64,3              | -0,77                                  | 0,34                            |
| Ecuador, ECU              | 20   | 100  | 50,5               | -0,6                             | -0,6                             |                       |                    | -0,65                                  | 0,42                            |
| Egypt, EGY                | 13   | 54   | 0,1                | 2                                | 0,8                              | 5                     | na                 | -0,56                                  | 0,45                            |
| El Salvador, SLV          | 9  | 99,4   | 12,8               | -1,4                             | -1,6                             | 12,4                  | -23,8              | -0,43                                  | 0,42                            |
| Equatorial Guinea, GNQ    | 23   | 43,75  | 55,9               | -0,7                             | -0,7                             |                       |                    | -1,83                                  |                                 |
| Eritrea, ERI              | 5  | 25   | 15                 | -0,3                             | -0,3                             |                       |                    | -1,34                                  |                                 |
| Estonia, EST              | 20   | 63,42  | 52,7               | 0                                | 0                                |                       |                    | 1,25                                   | 0,78                            |
| Ethiopia, ETH             | 19   | 60,57  | 11,4               | -0,8                             | 0,3                              | 32                    | -57,2              | -0,41                                  | 0,44                            |
| Fiji, FJI                 |  |  | 55,7               | 0,3                              | 0,5                              |                       |                    | -0,06                                  |                                 |
| Finland, FIN              | 14,9   | 16,12  | 73,1               | 0,1                              | 0                                |                       |                    | 2,28                                   | 0,92                            |
| France, FRA               | 26   | 1,07   | 31                 | 0,7                              | 0,7                              |                       |                    | 1,28                                   | 0,74                            |
| French Guiana             |  |  | 98,6               | 0                                | 0                                |                       |                    | 1,03                                   |                                 |
| French Polynesia          |  |  | 42,3               | 4,2                              | 0                                |                       |                    |  |                                 |
| Gabon, GAB                | 20,1   | 90,91  | 89,3               | 0,2                              | 0,9                              | 5                     | na                 | -0,67                                  |                                 |
| Gambia, GMB               | 4,1  | 33,33  | 48,8               | 0,4                              | 0,3                              | 5,3                   | -60,3              | -0,77                                  |                                 |
| Georgia, GEO              | 8,3  | 2,25   | 40,6               | 0,1                              | 0                                | 7,4                   | -86,8              | 0,64                                   | 0,73                            |
| Germany, DEU              | 37,7   | 26,46  | 32,8               | 0                                | 0                                |                       |                    | 1,82                                   | 0,84                            |
| Ghana, GHA                | 15,1   | 95,01  | 41                 | 0,3                              | 0,3                              | 5                     | na                 | -0,18                                  | 0,41                            |
| Greece, GRC               | 35   | 39,33  | 31,5               | 0,8                              | 0,8                              |                       |                    | -0,13                                  | 0,55                            |
| Grenada GRD               |  |  | 50                 | 0                                | 0                                |                       |                    | 0,31                                   | 0,69                            |
| Guadeloupe, GLP           | 72,8   | 5,89   | 42,5               | -0,1                             | -0,1                             |                       |                    |  |                                 |
| Guatemala, GTM            | 31,7   | 27,41  | 33                 | -1,2                             | -1                               | 15,6                  | 4,7                | -0,71                                  | 0,34                            |
| Guinea, GIN               | 30,7   | 98,4   |                    | -0,5                             | -0,6                             | 16,4                  | -29                | -0,97                                  |                                 |
| Guinea-Bissau, GNB        | 16,7   | 94,45  | 70,1               | -0,5                             | -0,5                             | 20,7                  | -10,5              | -1,43                                  |                                 |
| Guyana, GUY               |  | 0  | 84                 | 0                                | -0,1                             |                       |                    | -0,77                                  | 0,46                            |
| Haiti, HTI                | 0,3  | 12,5   | 3,5                | -0,7                             | -0,8                             | 53,4                  | -12,6              | -1,26                                  |                                 |
| Honduras, HND             | 28,4   | 62,13  | 41                 | -2,3                             | -2,4                             | 12,2                  | -47,1              | -0,57                                  | 0,36                            |
| Hong Kong, HKG            | 41,9   | 63,46  |                    |                                  |                                  |                       |                    | 1,67                                   | 0,85                            |
| Hungary, HUN              | 22,6   | 72,33  | 22,7               | 0,6                              | 0,2                              |                       |                    | 0,10                                   | 0,51                            |
| Iceland, ISL              | 17,4   | 12,31  | 0,5                | 4,6                              | 2,9                              |                       |                    | 1,95                                   |                                 |
| India, IND                | 6  | 18,75  | 23,8               | 0,4                              | 0,3                              | 15,2                  | -36                | -0,38                                  | 0,44                            |
| Indonesia, IDN            | 11,9   | 17,95  | 53                 | -1,1                             | -0,7                             | 7,6                   | -61,6              | -0,45                                  | 0,38                            |
| Iran (Islamic Republic Of | 8,6  | 31,9   | 5,8                | 0,7                              | 0                                | 5                     | na                 | -0,61                                  | 0,48                            |
| Iraq, IRQ                 | 1,5  | 21,74  | 1,9                | 0,1                              | 0                                | 28,8                  | 189,7              | -1,37                                  |                                 |
| Ireland, IRL              | 14,4   | 81   | 10,9               | 2                                | 0,8                              |                       |                    | 1,64                                   |                                 |
| Israel, ISR               | 19,9   | 60,07  | 7,6                | 0,9                              | 1,4                              |                       |                    | 0,89                                   |                                 |
| Italy, ITA                | 21,5   | 77,21  | 31,6               | 0,8                              | 0,6                              |                       |                    | -0,05                                  | 0,6                             |
| Jamaica, JAM              | 15,9   | 10   | 31                 | -0,1                             | -0,1                             | 8,1                   | -22,3              | -0,33                                  | 0,55                            |
| Japan, JPN                | 19,4   | 1,2  | 68,5               | 0                                | 0                                |                       |                    | 1,61                                   | 0,83                            |
| Jersey                    |  |  | 5,2                | 0                                | 0                                |                       |                    | 1,19                                   |                                 |
| Jordan, JOR               | 1,7  | 73,33  | 1,1                | 0                                | 0                                | 5                     | na                 | 0,26                                   | 0,66                            |
| Kazakhstan, KAZ           | 3,3  | 33,02  | 1,2                | -0,1                             | 0                                | 5                     | na                 | -0,76                                  | 0,43                            |
| Kyrgyzstan, KGZ           |  |  | 3,3                | -1,1                             | -1,2                             |                       |                    | -1,08                                  | 0,28                            |
| Kenya, KEN                | 12,4   | 86,41  | 7,8                | -0,3                             | 0,9                              | 21,2                  | -34,5              | -1,01                                  | 0,26                            |

|                          | BIODIV: protected areas                      |  | FAO FOREST DATA    |                                  |                                  | FOOD INSECURITY       |                    | Corruption                             |                                 |
|--------------------------|--|--|--------------------|----------------------------------|----------------------------------|-----------------------|--------------------|--|---------------------------------|
|                          | % territory which is declared protected area | % of declared protected area which is IUCN not reported or IUCN not applicable | % land area (2015) | % annual change rate (1990-2015) | % annual change rate (2010-2015) | % undernourished 2015 | % Change 1990-2015 | World Bank Control of corruption index | WJP Absence of corruption index |
| Laos                     | 16,7   | 36,36  | 81,3               | 0,2                              | 1                                | 18,5                  | -56,8              | -0,84                                  |                                 |
| Latvia,LVA               | 18,2   | 38,33  | 54                 | 0,2                              | 0                                |                       |                    | 0,40                                   |                                 |
| Lebanon,LBN              | 2,6  | 91,17  | 13,4               | 0,2                              | 0,1                              | 5                     | na                 | -0,88                                  | 0,36                            |
| Lesotho,LSO              | 0,3  | 75   | 1,6                | 0,8                              | 2,2                              | 11,2                  | -28                | 0,07                                   |                                 |
| Liberia,LBR              | 2,5  | 100  | 43,4               | -0,7                             | -0,7                             | 31,9                  | 10                 | -0,61                                  | 0,26                            |
| Libya,LBY                | 0,2  | 62,5   | 0,1                | 0                                | 0                                |                       |                    | -1,69                                  |                                 |
| Lithuania,LTU            | 16,9   | 58,37  | 34,8               | 0,5                              | 0,1                              |                       |                    | 0,56                                   |                                 |
| Luxembourg,LUX           | 32,3   | 39,53  | 33,5               | 0                                | 0                                |                       |                    | 2,12                                   |                                 |
| Macau,MAC                | 0  | 0  |                    |                                  |                                  |                       |                    | 0,62                                   |                                 |
| Macedonia,MKD            | 9,7  | 3,84   | 39,6               | 0,4                              | 0                                |                       |                    | -0,13                                  | 0,5                             |
| Madagascar,MDG           | 5,2  | 63,26  | 21,4               | -0,4                             | -0,1                             | 33                    | 21                 | -0,76                                  | 0,3                             |
| Malawi,MWI               | 16,9   | 93,18  | 33,4               | -0,9                             | -0,6                             | 20,7                  | -53,7              | -0,76                                  | 0,36                            |
| Malaysia,MYS             | 19,1   | 66,85  | 67,6               | 0                                | 0,1                              | 5                     | na                 | 0,28                                   | 0,61                            |
| Mali,MLI                 | 8,2  | 20   | 3,9                | -1,4                             | -1,6                             | 5                     | na                 | -0,65                                  |                                 |
| Malta,MLT                | 23,8   | 36,78  | 1,1                | 0                                | 0                                |                       |                    | 0,92                                   |                                 |
| Martinique,MTQ           | 69,1   | 0  | 45,8               | 0                                | 0                                |                       |                    | 1,25                                   |                                 |
| Mauritania,MRT           | 6  | 77,78  | 0,2                | -2,4                             | -1,5                             | 5,6                   | -61,6              | -0,91                                  |                                 |
| Mauritius,MUS            | 4,7  | 25   | 19,2               | -0,3                             | 0,1                              |                       |                    | 0,40                                   |                                 |
| Mexico,MEX               | 14,3   | 57,32  | 34                 | -0,2                             | -0,1                             | 5                     | na                 | -0,74                                  | 0,32                            |
| Mongolia,MNG             | 17,4   | 16,82  | 8,1                | 0                                | -0,8                             | 20,5                  | -31,5              | -0,47                                  | 0,41                            |
| Montenegro,MNE           | 4,1  | 50   | 61,5               | 1,1                              | 0                                |                       |                    | -0,09                                  |                                 |
| Morocco,MAR              | 30,8   | 87,89  | 12,6               | 0,5                              | -0,1                             | 5                     | na                 | -0,25                                  | 0,54                            |
| Mozambique,MOZ           | 21,6   | 68   | 48,2               | -0,5                             | -0,5                             | 25,3                  | -54,9              | -0,79                                  |                                 |
| Myanmar                  |  |  | 44,2               | -1,2                             | -1,8                             |                       |                    | -0,89                                  | 0,44                            |
| Namibia,NAM              | 37,9   | 89,19  | 8,4                | -0,9                             | -1                               | 42,3                  | 18                 | 0,28                                   |                                 |
| Nepal,NPL                | 23,6   | 34,69  | 25,4               | -1,1                             | 0                                | 7,8                   | -65,6              | -0,55                                  | 0,38                            |
| Netherlands,NLD          |  | 0  | 11,1               | 0,3                              | 0,2                              |                       |                    | 1,89                                   | 0,88                            |
| New Caledonia,NCL        | 54,4   | 41,33  | 45,9               | 0                                | 0                                |                       |                    |  |                                 |
| New Zealand,NZL          | 32,5   | 4,32   | 38,6               | 0,2                              | 0                                |                       |                    | 2,29                                   | 0,9                             |
| Nicaragua,NIC            | 37,2   | 45,27  | 25,9               | -1,5                             | 0                                | 16,6                  | -69,5              | -0,87                                  | 0,37                            |
| Niger,NER                | 17,3   | 66,67  | 0,9                | -2,1                             | -1,1                             | 9,5                   | -65,9              | -0,58                                  |                                 |
| Nigeria,NGA              | 13,9   | 97,3   | 7,7                | -3,5                             | -5                               | 7                     | -67                | -1,10                                  | 0,3                             |
| Norway,NOR               | 17   | 2,25   | 39,8               | 0                                | 0                                |                       |                    | 2,26                                   | 0,92                            |
| Oman,OMN                 | 2,6  | 6,25   | 0                  | 0                                | 0                                | 5                     | na                 | 0,20                                   |                                 |
| Pakistan,PAK             | 12,3   | 57,3   | 1,9                | -2,1                             | -2,7                             | 22                    | -12,4              | -0,76                                  | 0,33                            |
| Panama,PAN               | 20,9   | 75,79  | 62,1               | -0,4                             | -0,4                             | 9,5                   | -64,2              | -0,34                                  | 0,45                            |
| Papua New Guinea,PNG     | 3,1  | 91,55  | 72,5               | 0                                | 0                                |                       |                    | -0,99                                  |                                 |
| Paraguay,PRY             | 6,5  | 36,37  | 38,6               | -1,3                             | -2                               | 10,4                  | -46,6              | -0,94                                  |                                 |
| Peru,PER                 | 21,3   | 3,28   | 57,8               | -0,2                             | -0,2                             | 7,5                   | -76,2              | -0,60                                  | 0,36                            |
| Philippines,PHL          | 15,3   | 30,23  | 27                 | 0,8                              | 3,3                              | 13,5                  | -48,8              | -0,43                                  | 0,48                            |
| Poland,POL               | 39,6   | 33,74  | 30,8               | 0,2                              | 0,2                              | 14,62                 |                    | 0,58                                   | 0,73                            |
| Portugal,PRT             | 20,3   | 49,89  | 35,3               | -0,3                             | -0,4                             |                       |                    | 0,92                                   | 0,72                            |
| Puerto Rico,PRI          | 7,4  | 6,02   | 57,9               | 2,2                              | 0,7                              |                       |                    | 0,13                                   |                                 |
| Qatar,QAT                | 2,4  | 80   | 0                  |                                  |                                  |                       |                    | 0,98                                   |                                 |
| Republic of Congo,COG (  | 40,6   | 65,63  | 65,4               | -0,1                             | -0,1                             | 30,5                  | -29,6              | -1,22                                  |                                 |
| Republic Of Korea, KOR ( | 11,2   | 1,83   | 63,7               | -0,1                             | -0,1                             | 5                     | na                 | 0,49                                   | 0,65                            |
| Republic of Kosovo,KOS   | 0  | 0  |                    |                                  |                                  |                       |                    | -0,52                                  |                                 |
| Republic of Moldova,MD   | 4,2  | 4,5  | 12,4               | 1                                | 1,2                              |                       |                    | -0,88                                  | 0,28                            |



|                              | BIODIV: protected areas                      |  | FAO FOREST DATA    |                                  |                                  | FOOD INSECURITY       |                    | Corruption                             |                                 |
|------------------------------|--|--|--------------------|----------------------------------|----------------------------------|-----------------------|--------------------|--|---------------------------------|
|                              | % territory which is declared protected area | % of declared protected area which is IUCN not reported or IUCN not applicable | % land area (2015) | % annual change rate (1990-2015) | % annual change rate (2010-2015) | % undernourished 2015 | % Change 1990-2015 | World Bank Control of corruption index | WJP Absence of corruption index |
| Russian Federation,RUS       | 9,7  | 3,83   | 49,8               | 0                                | 0                                |                       |                    | -0,86                                  | 0,41                            |
| Rwanda,RWA                   | 9,1  | 50   | 19,5               | 1,7                              | 1,5                              | 31,6                  | -43,1              | 0,67                                   |                                 |
| Saudi Arabia,SAU             | 4,3  | 80,16  | 0,5                | 0                                | 0                                | 5                     | na                 | 0,06                                   |                                 |
| Senegal,SEN                  | 25,2   | 89,52  | 43                 | -0,5                             | -0,5                             | 24,6                  | 0,1                | 0,03                                   | 0,55                            |
| Serbia,SRB                   | 6,1  | 37,5   | 31,1               | 0,7                              | 0,1                              |                       |                    | -0,24                                  | 0,41                            |
| Seychelles,SYC               | 42,1   | 24   | 88,4               | 0                                | 0                                |                       |                    | 0,89                                   |                                 |
| Sierra Leone,SLE             | 9,4  | 86   | 42,5               | -0,1                             | 2,2                              | 22,3                  | -47,9              | -0,78                                  | 0,3                             |
| Singapore,SGP                | 5,6  | 0  | 23,4               | 0                                | 0                                |                       |                    | 2,13                                   | 0,93                            |
| Slovakia,SVK                 | 37,3   | 35,15  | 40,3               | 0                                | 0                                |                       |                    | 0,15                                   |                                 |
| Slovenia,SVN                 | 53,6   | 0,17   | 62                 | 0,2                              | 0                                |                       |                    | 0,73                                   | 0,6                             |
| Somalia,SOM                  | 0,8  | 100  | 10,1               | -1                               | -1,2                             |                       |                    | -1,62                                  |                                 |
| South Africa,ZAF             | 14,1   | 100  | 7,6                | 0                                | 0                                | 5                     | na                 | -0,04                                  | 0,55                            |
| Spain,ESP                    | 28   | 74,79  | 36,9               | 1,2                              | 0,2                              |                       |                    | 0,49                                   | 0,69                            |
| Sri Lanka,LKA                | 29,9   | 20   | 33                 | -0,4                             | -0,3                             | 22                    | -28,3              | -0,37                                  | 0,45                            |
| St. Kitts & Nevis            |  |  | 42,3               | 0                                | 0                                |                       |                    | 0,27                                   | 0,68                            |
| St. Lucia                    |  |  | 33,3               | -0,3                             | -0,3                             |                       |                    | 0,45                                   | 0,68                            |
| St. Vincent & the Grenadines |  |  | 69,2               | 0,3                              | 0                                |                       |                    | 0,62                                   | 0,67                            |
| Sudan,SDN                    | 2,3  | 69,56  | 10,3               | -0,8                             | -0,9                             | na                    | na                 | -1,50                                  |                                 |
| Suriname,SUR                 | 14,5   | 36,37  | 95,4               | 0                                | 0                                |                       |                    | -0,57                                  | 0,56                            |
| Swaziland,SWZ                | 4,1  | 13,04  | 34,1               | 0,9                              | 0,8                              | 26,8                  | 68,6               | -0,32                                  |                                 |
| Sweden,SWE                   | 14,5   | 74,39  | 68,4               | 0                                | 0                                |                       |                    | 2,25                                   | 0,91                            |
| Switzerland,CHE              | 9,7  | 0,27   | 31,4               | 0,3                              | 0,3                              |                       |                    | 2,17                                   |                                 |
| Syrian Arab Republic,SYR     | 0,7  | 100  | 2,7                | 1,1                              | 0                                |                       |                    | -1,53                                  |                                 |
| Taiwan                       | 19,7   | 1,09   |                    |                                  |                                  |                       |                    | 0,80                                   |                                 |
| Tajikistan,TJK               | 22,3   | 23,08  | 3                  | 0                                | 0,1                              | 33,2                  | 18,2               | -1,00                                  |                                 |
| Tanzania,TZA                 | 38,1   | 88,82  | 52                 | -0,8                             | -0,8                             | 32,1                  | 32,9               | -0,72                                  | 0,39                            |
| Thailand,THA                 | 18,8   | 8,4  | 32,1               | 0,6                              | 0,2                              | 7,4                   | -78,7              | -0,40                                  | 0,47                            |
| Togo,TGO                     | 27,6   | 89,13  | 3,5                | -5                               | -8,1                             | 11,4                  | -69,9              | -0,71                                  |                                 |
| Trinidad & Tobago            |  |  | 45,7               | -0,1                             | 0,7                              |                       |                    | -0,54                                  | 0,54                            |
| Tunisia,TUN                  | 5,4  | 90,19  | 6,7                | 1,9                              | 1                                | 5                     | na                 | -0,11                                  | 0,47                            |
| Turkey,TUR                   | 5,3  | 100  | 15,2               | 0,8                              | 0,9                              | 5                     | na                 | -0,11                                  | 0,48                            |
| Turkmenistan,TKM             | 3,2  | 50,01  | 8,8                | 0                                | 0                                | 5                     | na                 | -1,26                                  |                                 |
| Uganda,UGA                   | 16,1   | 95,08  | 10,4               | -3,3                             | -5,5                             | 25,5                  | 10,1               | -1,05                                  | 0,27                            |
| Ukraine,UKR                  | 4  | 1,41   | 16,7               | 0,2                              | 0,2                              |                       |                    | -0,98                                  | 0,36                            |
| United Arab Emirates,ARE     | 13,1   | 100  | 3,9                | 1,1                              | 0,3                              | 5                     | na                 | 1,12                                   | 0,8                             |
| United Kingdom GBR           | 28,2   | 13,39  | 13                 | 0,5                              | 0,5                              |                       |                    | 1,87                                   | 0,82                            |
| United States America,USA    | 13   | 2,08   | 33,8               | 0,1                              | 0,1                              |                       |                    | 1,38                                   | 0,73                            |
| Uruguay,URY                  | 3,5  | 43,33  | 10,5               | 3,4                              | 1,3                              | 5                     | na                 | 1,30                                   | 0,77                            |
| Uzbekistan,UZB               | 3,4  | 27,78  | 7,3                | 0,2                              | -0,3                             | 5                     | na                 | -1,16                                  | 0,33                            |
| Venezuela ,VEN               | 54,1   | 25,5   | 52,9               | -0,4                             | -0,3                             | 5                     | na                 | -1,33                                  | 0,25                            |
| Viet Nam,VNM                 | 7,6  | 58,65  | 47,6               | 1,8                              | 0,9                              | 11                    | -75,8              | -0,45                                  | 0,45                            |
| Yemen,YEM                    | 0,8  | 100  | 1                  | 0                                | 0                                | 26,1                  | -9,7               | -1,45                                  |                                 |
| Zambia,ZMB                   | 38   | 88,66  | 65,4               | -0,3                             | -0,3                             | 47,8                  | 41,4               | -0,41                                  | 0,4                             |
| Zimbabwe,ZWE                 | 27,2   | 72,84  | 36,4               | -1,8                             | -2,1                             | 33,4                  | -21,9              | -1,29                                  | 0,29                            |

Annex 2. Source data for building the radar diagrams

|                                 | Ranking % of territory in protected areas (1 best à-to 174 worst) | Ranking change in forest area 2010-2015 (1 best to 170 worst) | Ranking undernourishment (1 best to 171 worst) | Ranking world bank corruption index (1 best to 172 worst) | (GDP ranking per capita (1 best to 153 worst)) |
|---------------------------------|---|---|--|---|--|
| Afghanistan,AFG                 | 174   | 60  | 155  | 163   | 139  |
| Albania,ALB                     | 77  | 112   | 1  | 99  | 91   |
| Algeria,DZA                     | 124   | 34  | 72   | 120   | 87   |
| American Samoa,ASM              | 149   | 121   | 73   | 28  |  |
| Andorra,AND                     | 57  | 61  | 1  | 29  |  |
| Angola,AGO                      | 128   | 122   | 131  | 165   | 88   |
| Anguilla,AIA                    | 133   | 62  | 1  | 30  |  |
| Antigua and Barbuda,ATG         | 67  | 63  | 1  | 47  | 46   |
| Argentina,ARG                   | 117   | 153   | 74   | 111   | 48   |
| Armenia,ARM                     | 46  | 50  | 106  | 101   | 97   |
| Aruba,ABW                       | 166   | 64  | 1  | 22  |  |
| Australia,AUS                   | 78  | 42  | 1  | 10  | 6  |
| Austria,AUT                     | 35  | 65  | 1  | 20  | 14   |
| Azerbaijan,AZE                  | 110   | 4   | 75   | 134   | 77   |
| Bahamas,BHS                     | 25  | 66  | 1  | 24  | 30   |
| Bahrain,BHR                     | 129   | 3   | 1  | 62  | 31   |
| Bangladesh,BGD                  | 141   | 123   | 138  | 138   | 122  |
| Barbados,BRB                    | 167   | 67  | 76   | 15  | 43   |
| Belarus,BLR                     | 118   | 43  | 1  | 88  | 75   |
| Belgium,BEL                     | 47  | 51  | 1  | 19  | 20   |
| Belize,BLZ                      | 13  | 132   | 107  | 78  | 82   |
| Benin,BEN                       | 30  | 154   | 111  | 115   | 131  |
| Bermuda,BMU                     | 134   | 68  | 1  | 31  |  |
| Bhutan,BTN                      | 6   | 35  | 1  | 35  | 103  |
| Bolivia ,BOL                    | 26  | 135   | 136  | 121   | 100  |
| Bosnia and Herzegovina,BIH      | 162   | 69  | 1  | 90  | 85   |
| Botswana,BWA                    | 31  | 148   | 150  | 42  | 70   |
| Brazil,BRA                      | 32  | 124   | 77   | 97  | 62   |
| Brunei Darussalam,BRN           | 7   | 70  | 78   | 48  | 25   |
| Bulgaria,BGR                    | 20  | 32  | 1  | 83  | 66   |
| Burkina Faso,BFA                | 86  | 155   | 143  | 86  | 140  |
| Burundi,BDI                     | 130   | 7   | 1  | 153   | 153  |
| Cambodia,KHM                    | 40  | 159   | 132  | 149   | 123  |
| Cameroon,CMR                    | 108   | 156   | 121  | 148   | 121  |
| Canada,CAN                      | 119   | 71  | 1  | 13  | 15   |
| Cape Verde,CPV                  | 156   | 15  | 118  | 39  |  |
| Central African Republic,CAF    | 125   | 113   | 169  | 160   | 152  |
| Chad,TCD                        | 68  | 165   | 167  | 159   | 130  |
| Chile,CHL                       | 72  | 8   | 79   | 26  | 49   |
| China,CHN                       | 79  | 23  | 117  | 81  | 65   |
| Colombia,COL                    | 96  | 72  | 116  | 82  | 72   |
| Comoros,COM                     | 111   | 150   | 1  | 116   | 134  |
| Costa Rica,CRI                  | 36  | 16  | 80   | 45  | 54   |
| Côte D'Ivoire,CIV               | 48  | 73  | 129  | 95  | 117  |
| Croatia,HRV                     | 14  | 74  | 1  | 60  | 53   |
| Cuba,CUB                        | 104   | 9   | 81   | 66  |  |
| Cyprus,CYP                      | 73  | 75  | 1  | 36  | 29   |
| Czech Republic,CZE              | 53  | 52  | 1  | 56  | 37   |
| Democratic Republic of Congo,CO | 101   | 125   | 158  | 155   | 147  |
| Denmark,DNK                     | 41  | 24  | 1  | 5   | 9  |
| Djibouti,DJI                    | 163   | 76  | 137  | 109   | 111  |
| Dominican Republic,DOM          | 49  | 10  | 127  | 130   | 68   |
| Ecuador,ECU                     | 61  | 139   | 1  | 118   | 71   |
| Egypt,EGY                       | 99  | 25  | 82   | 106   | 96   |
| El Salvador,SLV                 | 120   | 161   | 128  | 98  | 86   |
| Equatorial Guinea,GNQ           | 50  | 142   | 1  | 172   | 44   |
| Eritrea,ERI                     | 142   | 127   | 1  | 162   |  |
| Estonia,EST                     | 62  | 77  | 1  | 27  | 38   |
| Ethiopia,ETH                    | 69  | 36  | 162  | 94  | 138  |
| Finland,FIN                     | 90  | 78  | 1  | 2   | 17   |
| France,FRA                      | 42  | 29  | 1  | 25  | 22   |

|                                | Ranking %<br>of territory<br>in protected<br>areas (1<br>best à-to<br>174 worst) | Ranking<br>change in<br>forest area<br>2010-2015 (1<br>best to 170<br>worst) | Ranking<br>undernour<br>ishment<br>(1 best to<br>171 worst) | Ranking<br>world bank<br>corruption<br>index (1<br>best to 172<br>worst) | (GDP<br>ranking per<br>capita (1<br>best to 153<br>worst) |
|--------------------------------|--|--|---|--|---|
| Gabon,GAB                      | 60   | 19   | 83  | 119  | 63  |
| Gambia,GMB                     | 146  | 37   | 104   | 131  | 146   |
| Georgia,GEO                    | 122  | 79   | 109   | 49   | 95  |
| Germany,DEU                    | 17   | 80   | 1   | 14   | 18  |
| Ghana,GHA                      | 89   | 38   | 84  | 77   | 119   |
| Greece,GRC                     | 21   | 26   | 1   | 76   | 36  |
| Guadeloupe,GLP                 | 1  | 114  | 1   |  |   |
| Guatemala,GTM                  | 24   | 151  | 135   | 122  | 93  |
| Guinea,GIN                     | 28   | 140  | 139   | 143  | 144   |
| Guinea-Bissau,GNB              | 83   | 136  | 144   | 166  | 141   |
| Haiti,HTI                      | 171  | 145  | 171   | 156  | 129   |
| Honduras,HND                   | 33   | 166  | 126   | 107  | 105   |
| Hong Kong,HKG                  | 9  |  | 1   | 16   | 16  |
| Hungary,HUN                    | 51   | 44   | 1   | 65   | 52  |
| Iceland,ISL                    | 74   | 2  | 1   | 9  | 11  |
| India,IND                      | 135  | 39   | 134   | 91   | 114   |
| Indonesia,IDN                  | 105  | 143  | 113   | 102  | 98  |
| Iran (Islamic Republic Of),IRN | 121  | 81   | 85  | 113  |   |
| Iraq,IRQ                       | 165  | 82   | 157   | 164  | 80  |
| Ireland,IRL                    | 93   | 27   | 1   | 17   | 5   |
| Israel,ISR                     | 63   | 12   | 1   | 40   | 23  |
| Italy,ITA                      | 55   | 31   | 1   | 71   | 26  |
| Jamaica,JAM                    | 87   | 115  | 115   | 85   | 79  |
| Japan,JPN                      | 65   | 83   | 1   | 18   | 24  |
| Jordan,JOR                     | 164  | 84   | 86  | 59   | 81  |
| Kazakhstan,KAZ                 | 153  | 85   | 87  | 126  | 55  |
| Kenya,KEN                      | 102  | 20   | 146   | 147  | 118   |
| Laos                           | 84   | 17   | 141   | 135  | 113   |
| Latvia,LVA                     | 71   | 86   | 1   | 54   | 47  |
| Lebanon,LBN                    | 157  | 53   | 88  | 139  | 64  |
| Lesotho,LSO                    | 172  | 5  | 124   | 67   | 124   |
| Liberia,LBR                    | 159  | 144  | 161   | 114  | 148   |
| Libya,LBY                      | 173  | 87   | 1   | 171  |   |
| Lithuania,LTU                  | 81   | 54   | 1   | 51   | 45  |
| Luxembourg,LUX                 | 23   | 88   | 1   | 8  | 1   |
| Macedonia,MKD                  | 112  | 89   | 1   | 75   | 83  |
| Madagascar,MDG                 | 140  | 116  | 164   | 127  | 149   |
| Malawi,MWI                     | 82   | 141  | 145   | 129  | 150   |
| Malaysia,MYS                   | 66   | 55   | 89  | 57   | 56  |
| Mali,MLI                       | 123  | 162  | 90  | 117  | 133   |
| Malta,MLT                      | 44   | 90   | 1   | 38   | 32  |
| Martinique,MTQ                 | 2  | 91   | 1   | 32   |   |
| Mauritania,MRT                 | 136  | 160  | 105   | 141  |   |
| Mauritius,MUS                  | 143  | 56   | 1   | 55   | 58  |
| Mexico,MEX                     | 94   | 117  | 91  | 125  | 61  |
| Mongolia,MNG                   | 75   | 146  | 142   | 103  | 90  |
| Montenegro,MNE                 | 147  | 92   | 1   | 72   | 69  |
| Morocco,MAR                    | 27   | 118  | 92  | 80   | 102   |
| Mozambique,MOZ                 | 54   | 137  | 152   | 133  | 145   |
| Namibia,NAM                    | 16   | 152  | 168   | 58   | 84  |
| Nepal,NPL                      | 45   | 93   | 114   | 105  | 132   |
| Netherlands,NLD                | 106  | 45   | 1   | 11   | 12  |
| New Caledonia,NCL              | 3  | 94   | 1   |  |   |
| New Zealand,NZL                | 22   | 95   | 1   | 1  | 21  |
| Nicaragua,NIC                  | 19   | 96   | 140   | 137  | 110   |
| Niger,NER                      | 76   | 157  | 119   | 110  | 151   |
| Nigeria,NGA                    | 97   | 168  | 108   | 151  | 104   |

|                                | Ranking %<br>of territory<br>in protected<br>areas (1<br>best à-to<br>174 worst) | Ranking<br>change in<br>forest area<br>2010-2015 (1<br>best to 170<br>worst) | Ranking<br>undernour<br>ishment<br>(1 best to<br>171 worst) | Ranking<br>world bank<br>corruption<br>index (1<br>best to 172<br>worst) | (GDP<br>ranking per<br>capita (1<br>best to 153<br>worst) |
|--------------------------------|--|--|---|--|---|
| Norway,NOR                     | 80   | 97   | 1   | 3  | 3   |
| Oman,OMN                       | 158  | 98   | 93  | 61   | 41  |
| Pakistan,PAK                   | 103  | 167  | 147   | 128  | 115   |
| Panama,PAN                     | 58   | 133  | 120   | 87   | 50  |
| Papua New Guinea,PNG           | 155  | 99   | 1   | 145  |   |
| Paraguay,PRY                   | 131  | 163  | 122   | 142  | 89  |
| Peru,PER                       | 56   | 126  | 112   | 112  | 73  |
| Philippines,PHL                | 88   | 1  | 130   | 96   | 101   |
| Poland,POL                     | 11   | 46   | 133   | 50   | 51  |
| Portugal,PRT                   | 59   | 134  | 1   | 37   | 35  |
| Puerto Rico,PRI                | 127  | 30   | 1   | 64   |   |
| Qatar,QAT                      | 160  |  | 1   | 34   | 4   |
| Republic of Congo,COG (Brazza) | 10   | 119  | 159   | 154  | 112   |
| Republic Of Korea, KOR (sth)   | 107  | 120  | 94  | 52   | 27  |
| Republic of Kosovo,KOS         | 109  |  | 1   | 104  |   |
| Republic of Moldova,MDA        | 145  | 14   | 1   | 140  |   |
| Russian Federation,RUS         | 113  | 100  | 1   | 136  | 60  |
| Rwanda,RWA                     | 116  | 11   | 160   | 46   | 136   |
| Saudi Arabia,SAU               | 144  | 101  | 95  | 68   | 34  |
| Senegal,SEN                    | 43   | 138  | 151   | 69   | 127   |
| Serbia,SRB                     | 132  | 57   | 1   | 79   | 78  |
| Seychelles,SYC                 | 8  | 102  | 1   | 41   | 42  |
| Sierra Leone,SLE               | 115  | 6  | 149   | 132  | 137   |
| Singapore,SGP                  | 137  | 103  | 1   | 7  | 8   |
| Slovakia,SVK                   | 18   | 104  | 1   | 63   | 39  |
| Slovenia,SVN                   | 5  | 105  | 1   | 44   | 33  |
| Somalia,SOM                    | 168  | 158  | 1   | 170  | 143   |
| South Africa,ZAF               | 95   | 106  | 96  | 70   | 76  |
| Spain,ESP                      | 37   | 47   | 1   | 53   | 28  |
| Sri Lanka,LKA                  | 29   | 128  | 148   | 89   | 92  |
| Sudan,SDN                      | 161  | 149  | 172   | 168  | 106   |
| Suriname,SUR                   | 91   | 107  | 1   | 108  | 57  |
| Swaziland,SWZ                  | 148  | 28   | 156   | 84   | 99  |
| Sweden,SWE                     | 92   | 108  | 1   | 4  | 10  |
| Switzerland,CHE                | 114  | 40   | 1   | 6  | 2   |
| Syrian Arab Republic,SYR       | 170  | 109  | 1   | 169  |   |
| Taiwan                         | 64   |  | 1   | 43   |   |
| Tajikistan,TJK                 | 52   | 58   | 165   | 146  | 125   |
| Tanzania,TZA                   | 12   | 147  | 163   | 124  | 128   |
| Thailand,THA                   | 70   | 48   | 110   | 92   | 74  |
| Togo,TGO                       | 38   | 170  | 125   | 123  | 142   |
| Tunisia,TUN                    | 138  | 18   | 97  | 73   | 94  |
| Turkey,TUR                     | 139  | 21   | 98  | 74   | 59  |
| Turkmenistan,TKM               | 154  | 110  | 99  | 157  | 67  |
| Uganda,UGA                     | 85   | 169  | 153   | 150  | 135   |
| Ukraine,UKR                    | 150  | 49   | 1   | 144  | 108   |
| United Arab Emirates,ARE       | 98   | 41   | 100   | 33   | 19  |
| United Kingdom GBR             | 34   | 33   | 1   | 12   | 13  |
| United States America,USA      | 100  | 59   | 1   | 21   | 7   |
| Uruguay,URY                    | 151  | 13   | 101   | 23   | 40  |
| Uzbekistan,UZB                 | 152  | 129  | 102   | 152  | 107   |
| Venezuela ,VEN                 | 4  | 130  | 103   | 161  |   |
| Viet Nam,VNM                   | 126  | 22   | 123   | 100  | 109   |
| Yemen,YEM                      | 169  | 111  | 154   | 167  | 116   |
| Zambia,ZMB                     | 15   | 131  | 170   | 93   | 120   |
| Zimbabwe,ZWE                   | 39   | 164  | 166   | 158  | 126   |