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

Report on the framing of future research on the development of the indicator and its use in a decision tree tool

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Status: final report of 21st of March 2017 completed with the decision tree tool (1st of February 2018)

Table

1 Introduction

1.1 General overview of the report

This report contains two parts :

- Section 2 to 5 : construction of the governance indicators
- Section 6 : decision tree for using the indicators in sourcing decisions by companies

IMPORTANT REMARK

For the readers especially interest in the DECISION TREE FOR supporting SOURCING DECISIONS BY COMPANIES
****please directly go to section 6****
This section can be read autonomously.

For the readers wishing to understand the scientific and practical background for the choice of the indicators, please also have an in depth look at sections 2 to 5 of the report

1.2 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.

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.

1.3 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).
(4) Various meetings on the elaboration of the decision tree with the accompanying committee (Eline Botte (FOD VVVL), Pierre Biot (FOD VVL), Sabine Wallens (FOD VVL). Lead to the complementary section on the decision tree for the governance aspects in this report

1.4 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

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). 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

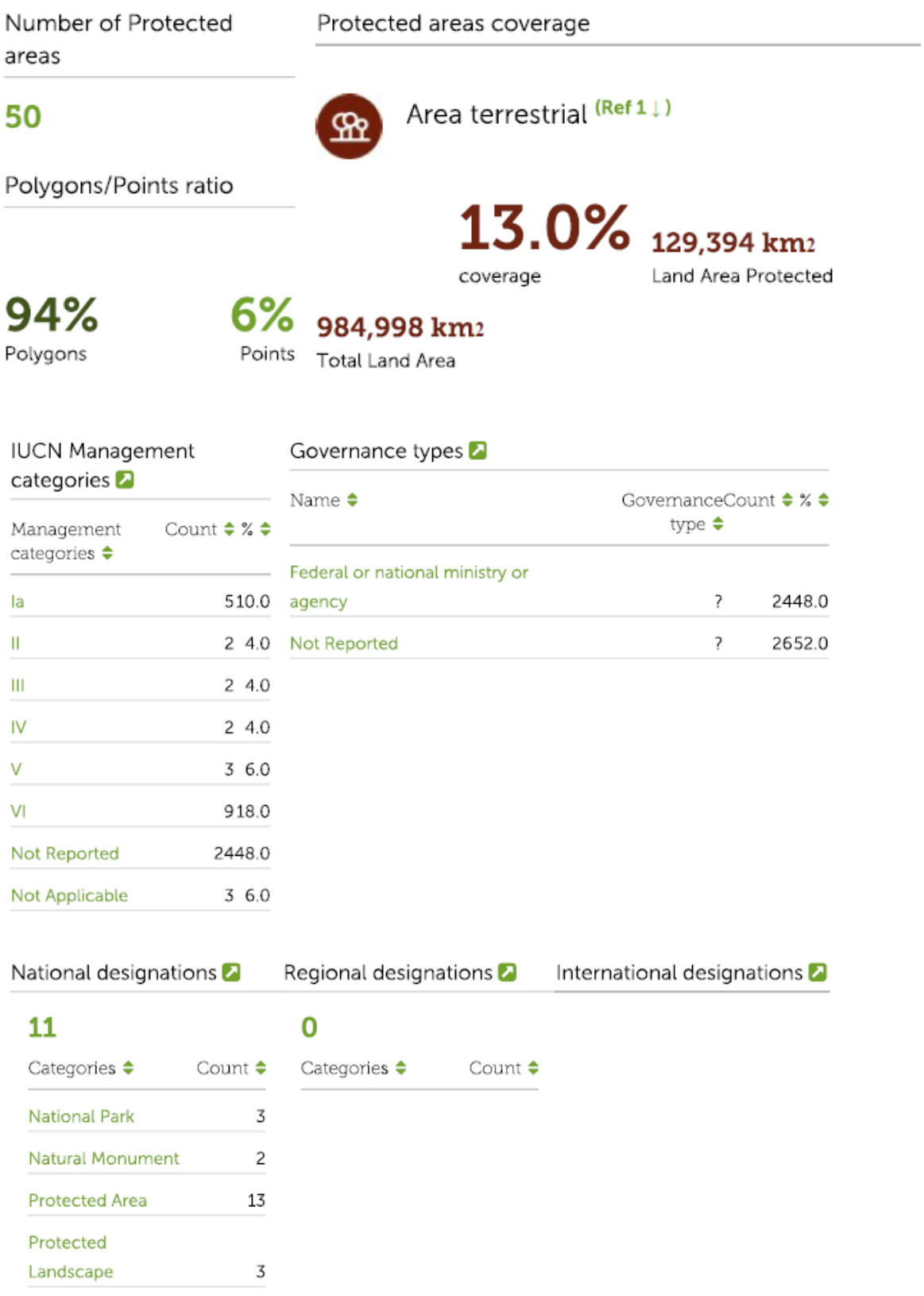
IUCN Category V-VI

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 Aras

Egypt



Number of Protected areas

50

Polygons/Points ratio

94% Polygons

6% Points

Protected areas coverage

Area terrestrial (Ref 1 ↓)

13.0% coverage

129,394 km2 Land Area Protected

984,998 km2 Total Land Area

IUCN Management categories

Management categories	Count	%
Ia	5	10.0
II	2	4.0
III	2	4.0
IV	2	4.0
V	3	6.0
VI	9	18.0
Not Reported	24	48.0
Not Applicable	3	6.0

Governance types

Name	Governance type	Count	%
Federal or national ministry or agency	?	24	48.0
Not Reported	?	26	52.0

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

Number of sources

Protected areas coverage

Area terrestrial (Ref 1 ↓)

17.0% coverage

1,598,471 km2 Land Area Protected

9,361,609 km2 Total Land Area

IUCN Management categories

Management categories	Count	%
Ia	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% coverage

174,220 km2 Land Area Protected

2,324,459 km2 Total Land Area

IUCN Management categories

Management categories	Count	%
Ia	5	6.58
II		1114.47
Not Reported		5369.74
Not Applicable	7	9.21

Governance types

Name	GovernanceCount type	%
Federal or national ministry or agency	?	1823.08
Not Reported	?	6076.92

National designations

5

Categories	Count
National Park	9
Nature Reserve	4
Marine Nature Reserve	1
Hunting Reserve	3
Cultural Park	2

Regional designations

1

Categories	Count
Specially Protected Areas of Mediterranean Importance (Barcelona Convention)	2

International designations

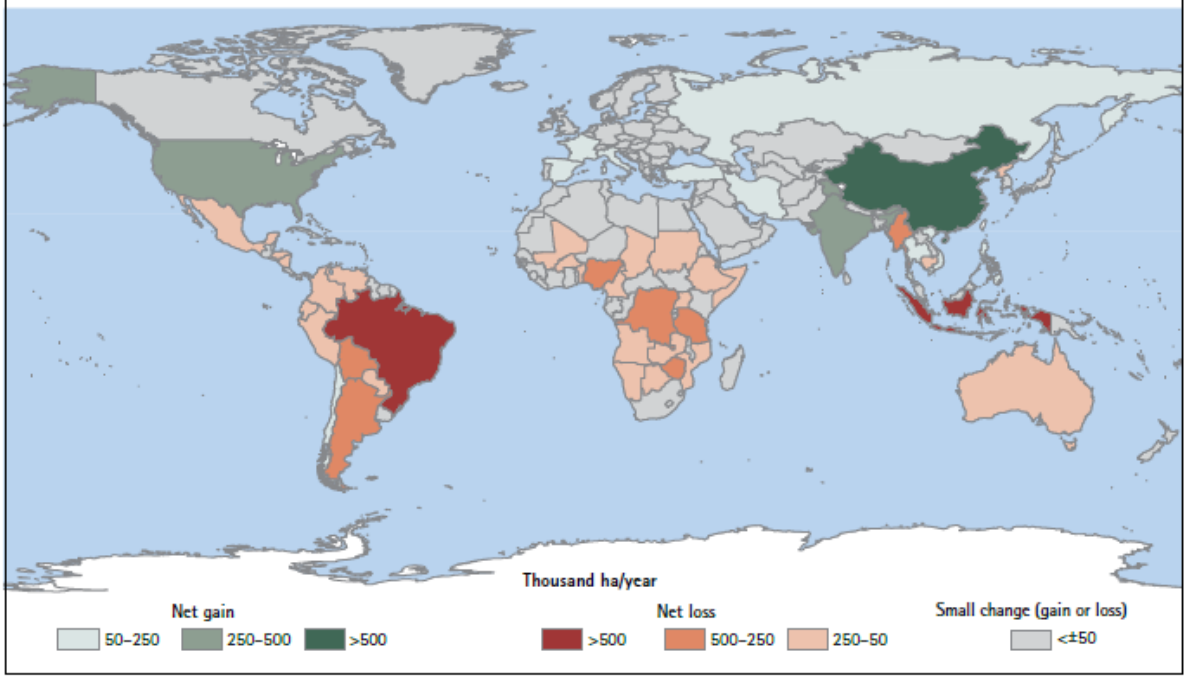
3

Categories	Count
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.

FIGURE 5 **Annual net forest gain/loss by country, 1990–2015**



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 2010-2105 (-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**.

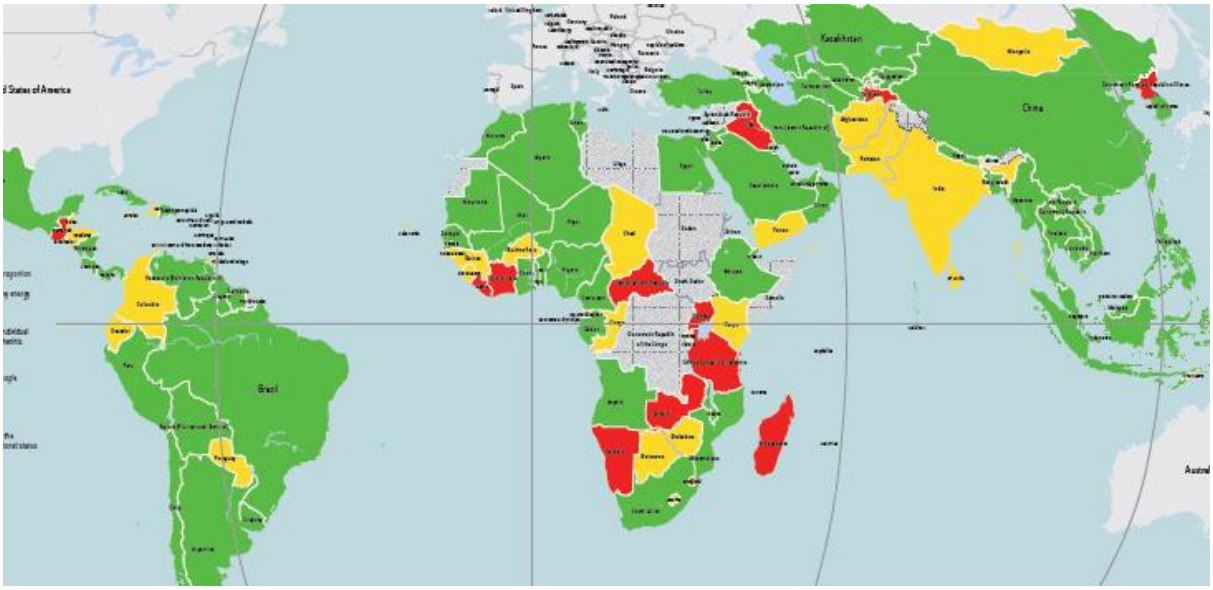


Figure. Achievement of the Millenium Development Goal Hunger Target, map available at http://www.fao.org/3/a-i4674e.pdf (in red: countries such as Guatemala, Madagascar, Namibia)

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

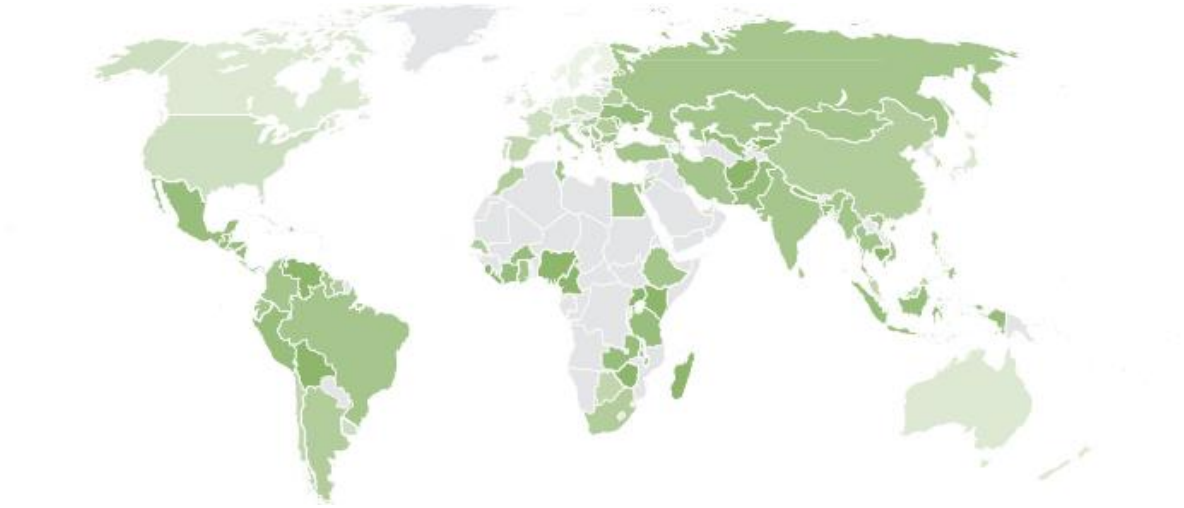
countries. This data is clearly relevant and can be used to complete other data sources for constructing the indicator (for instance when there is a need to conduct more in depth case study research). However, it too incomplete to be used to make the comparative ranking.

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/ JURISDICTION	SCORE	GLOBAL 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:

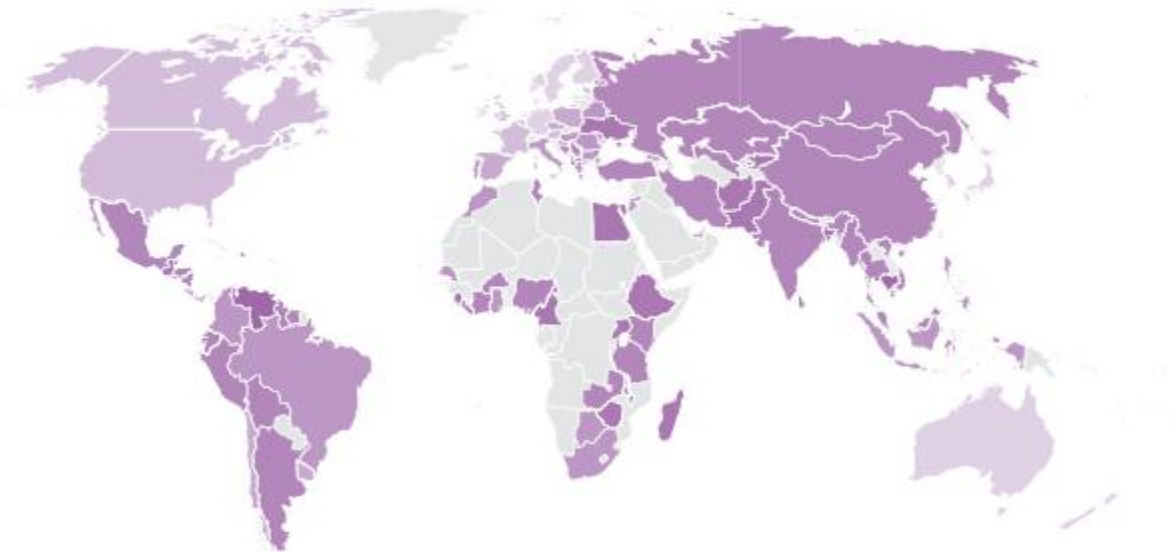
(https://cites.org/eng/news/pr/wildlife_crime_consortium_launches_enforcement_indicators_1301 2016)

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/ JURISDICTION	SCORE	GLOBAL 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** (>= 1% per year, meaning >= 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** (>= 1% per year, meaning >= 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 inexisting 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).

(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
	% 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 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)
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 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 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
	% 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 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)
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
	% 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 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)
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) 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 in individual country assessment

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[1]). 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 GPD 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)[2]. 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.

[1] https://www.google.be/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=0ahUKEwiujo_D_fbLAhXDuhoKHTBPBr4QFggjMAE&url=http%3A%2F%2Fassets.panda.org%2Fdownloads%2Fcommon_wildcapture_methodology_questionnaire.pdf&usg=AFQjCNGoTHFpAfgQw-MCmIuKAGhPGI0ong

[2] Another test that could be made for building "readable" radar diagrams is a logarithmic transformation of the data.

Detailed Radar diagram Indonesia

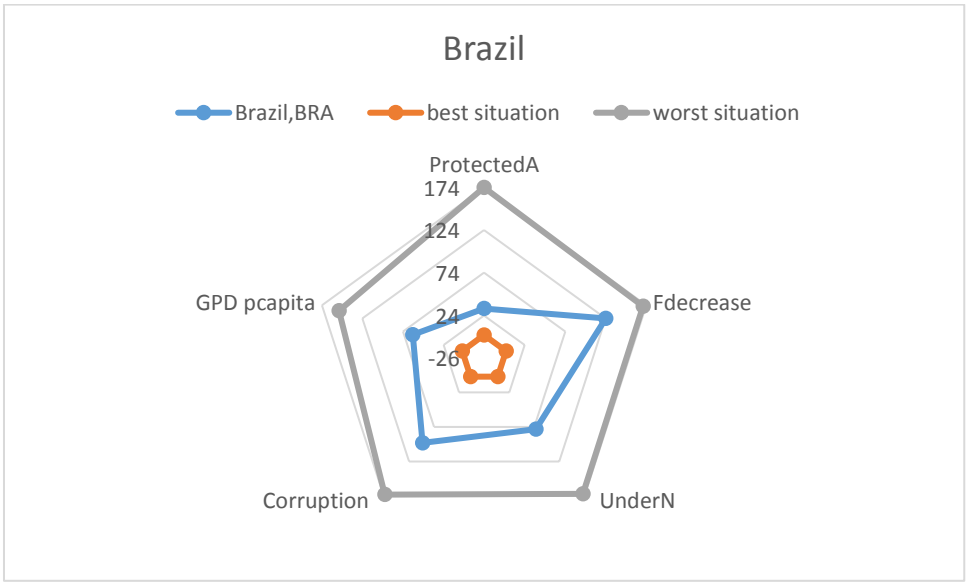
Country ranking for the 4 governance indicators + the control variable (GDP) as compared to the worst country situation in the database (in grey) and the best country situation in the database (in orange).

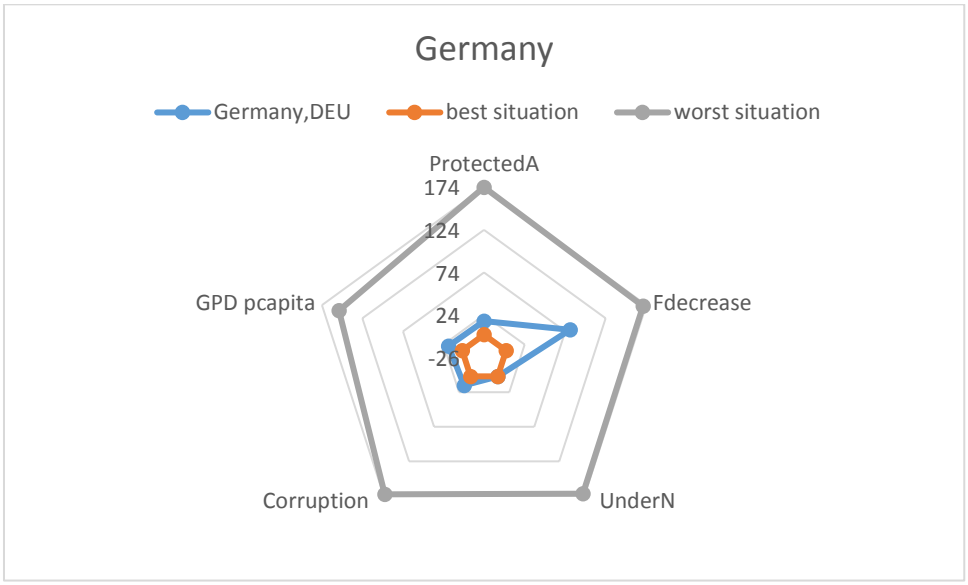
	best situation (in orange in the radar diagram)	Total number of countries with data (the country with this number is also the worst situation : in grey on the radar diagram)	Ranking of Indonesia (in blue)	Variation from best to worst in the database
ProtectedA	1	174	105	72% PA coverage to 0,1% coverage
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)

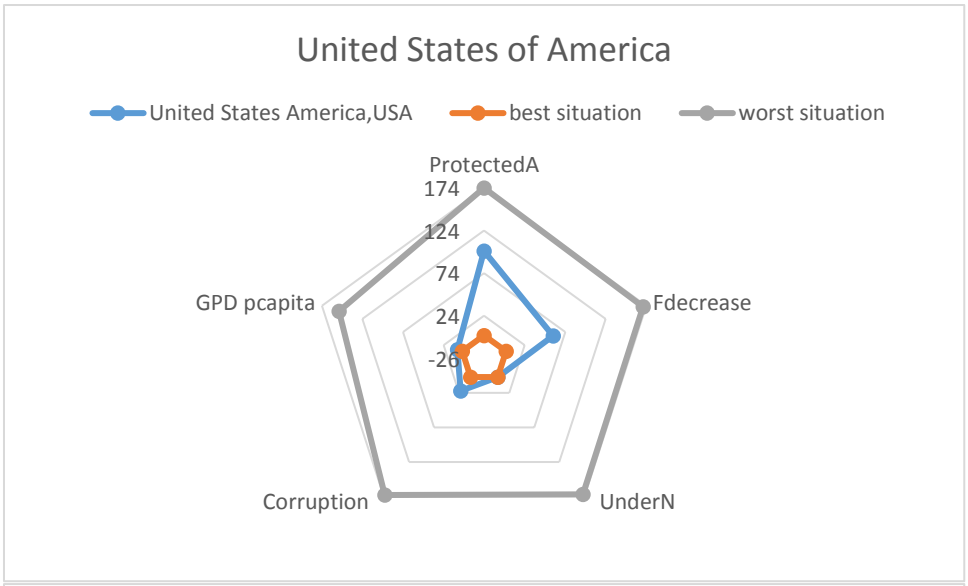
Legend: the numbers in the diagram indicate the ranking of the country on a given indicator from "1" (best comparative performance) to "174" (worst comparative performance). The best situation is indicated in "orange" (PS : the figure "- 26" has no meaning, but was added by the software and can be easily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

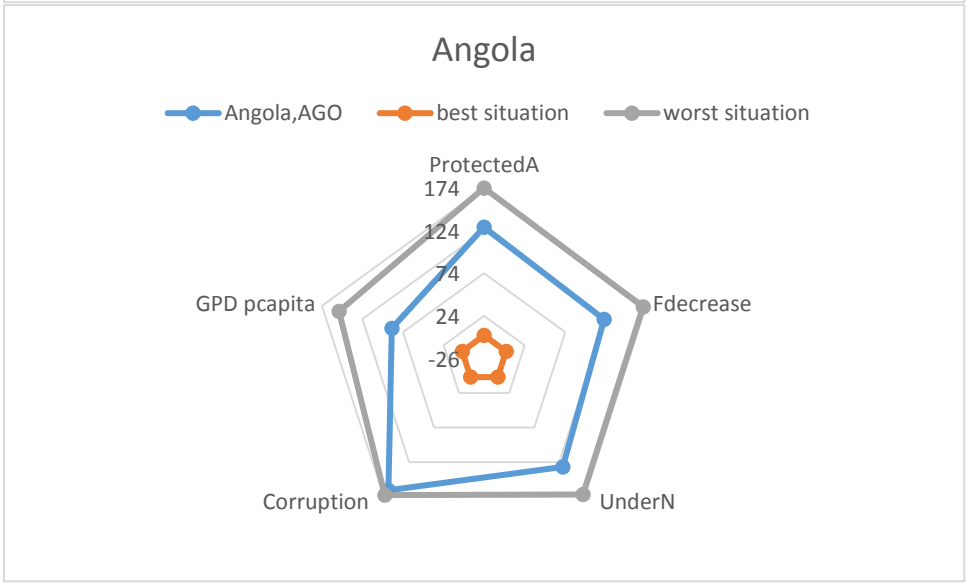
Illustration with other radar diagrams (all the source data: in Annex 2).

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
ProtectedA
174
124
74
24
-26
Fdecrease
UnderN
Corruption
GPD pcapita


Angola
Angola,AGO
best situation
worst situation
ProtectedA
174
124
74
24
-26
Fdecrease
UnderN
Corruption
GPD pcapita

6 Use of the key indicators in a decision making tree

The following decision tree uses the four most important key indicators of governance described in this report, respectively based on protected area surface, level of deforestation, undernourishment and control of corruption. The analysis of the decision tree in this section is done from the perspective of possible measures and actions on the level of governance. In particular, the analysis is made under the presumption that the user of the decision tree in parallel goes through two closely related components of the decisions tree (on production methods and status of biodiversity). Information and mitigation measures therefore focus here on the governance aspects, more specifically the transparency, accountability and monitoring of decision-making processes that play a role in effective biodiversity governance.

Furthermore the analysis is done for the case where the name of the source country or list of possible source countries is known. If the name is unknown, it is not possible to conduct the decision tree analysis with respect to the country level governance features discussed in this report. However, the user of the tool can be invited to do the exercise on a country or a list of country that are a good illustration of the type of source location he is considering.

STEP1 : Assess the likely absence of an effective protected area's policy

Rationale

There are no systematic and regularly updated indicators of reliable implementation of formally approved biodiversity policies for the various countries of the world. However, explained in this report, the surface of terrestrial protected areas in a country, under one of the recognized IUCN management categories, is a good proxy for assessing the effectiveness of policy action taken towards biodiversity. If a country belongs to the less well performing countries in terms of percentage of area that is protected, this is an indication of a very likely high degree of ineffectiveness. In such cases, additional information gathering on biodiversity governance in the country (quality of monitoring of the management, transparency, accountability) is recommended with the view to take responsible investment decisions on sourcing in that country.

Steps in the decision tree

(1) Access the statistics and download the data on protected areas in the source countries through the platform "Protected Planet" (www.protectedplanet.net). Type the name of the country in the "search the protected area" tab and take note of the following data for that country:

Protected area's coverage: area terrestrial (percentage of total land area)

(2) Check if the country belongs to the 15% less well performing countries or to the 25% less performing countries

The 15% less well preforming countries (based on 2018 data): less then 3,5% of total land area has established protection status under one of the IUCN management categories (highly likely ineffective biodiversity policies)

Between 15% and 25% less well preforming countries (based on 2018 data): between 3,5 % and less then 6% of total land area has established protection status under one of the IUCN management categories (likely ineffective biodiversity policies)

(3) If the country belongs to the 15% or 25% less well performing, or if the analysis of the data on protected area's coverage shows a reason of concern:

ACTION – If the country fails to deliver on a reasonable level of accreditation of protected areas, then biodiversity policies are potentially very ineffective and evaluation of biodiversity governance must be conducted with great care and failures mitigated to a certain extent, if possible.

Sub-action 1: obtain more information on the evolution/ongoing efforts at the country level for governing its protected areas system (quality of monitoring of the management, transparency, accountability). If the worrisome governance situation is confirmed consider alternative source locations or mitigation measures (cf. sub-action 2). Information can be obtained *inter alia* by accessing the data sources mentioned on the www.protectedplanet.net website, or by contacting the national authorities.

Sub-action 2: envision the feasibility of voluntary mitigation measures to strengthen the governance framework, as related to quality of monitoring, transparency and accountability of biodiversity policies. Possible governance supporting measures that might be considered (amongst others) are:

- clear public statements by the company on the engagement with the international standards on protected areas (IUCN and CBD) and the Convention on Biological Diversity more generally
- regular reporting by the companies, in particular on its efforts of verifying the effectiveness of biodiversity policy in the source areas
- fostering engagement of the suppliers of the company in the country to transparent decision making on how biodiversity concerns are taken into account in their decision making.

STEP2: Assess the likely absence of effective policy to combat deforestation

Rationale. The rationale is similar to the rationale of the protected areas indicator. If a country belongs to the 15% or 25% worst performing countries in combatting deforestation, it is likely or highly likely that the deforestation policy is ineffective. In such cases, additional information gathering on forest governance in the country (quality of monitoring of the management, transparency, accountability) is recommended to take responsible investment decisions related to sourcing in that country.

Steps in the decision tree

(1) Download the forest management data from the most recent FAO's Global Forest Resources Assessment (available on line at http://www.fao.org/forest-resources-assessment). Look in particular for the information on the deforestation rate over the last 5 years.

(2) Check if the country belongs to the 15% less well performing countries or to the 25% less performing countries

The 15% less well preforming countries: more then 0,8 annual deforestation rate over the last 5 years (based on the last statistics: 2010-1015)

Between 15% and 25% less well preforming countries: between 0,8 % and 0,3 % annual deforestation rate over the last 5 years (based on the last statistics: 2010-1015)

(3) If the country belongs to the 15% or 25% less performing on combatting of deforestation, or if the analysis of the data shows a reason of concern:

ACTION – If the country fails to deliver on a reasonable level of combatting of deforestation, then deforestation policies are potentially very ineffective and evaluation of forest governance must be conducted with great care and failures mitigated to a certain extent, if possible.

Sub-action 1: obtain more information on the evolution/ongoing efforts at the country level for combatting deforestation (quality of monitoring of deforestation rate, transparency of the governments' actions, accountability of its decisions). If the worrisome governance situation is confirmed consider alternative source locations or mitigation measures (cf. sub-action 2). Information can be obtained *inter alia* by accessing the data sources mentioned on the http://www.fao.org/forest-resources-assessment website, or by contacting the national authorities.

Sub-action 2: envision the feasibility of voluntary mitigation measures to strengthen the governance framework, as related to quality of monitoring, transparency and accountability of forest governance. Possible governance supporting measures that might be considered (amongst others) are

- clear public statements by the companies on its engagement against deforestation
- regular reporting by the companies on its efforts to verify the effectiveness of forest policy in the source areas
- fostering companies' suppliers engagement to transparent decision making on how deforestation concerns are taken into account in their decision making.

STEP3. Asses the level of lack of effective policies for eradication of undernourishment

Rationale. Access to arable lands is an important food security policy issue. Moreover, as explained above, allocation of arable land in situation of high pressure on land use also has an indirect impact on biodiversity policies. Indeed, in situations of high food insecurity, appropriation/allocation of land for other purposes (such as export oriented agriculture) increases overall pressure on land use and can indirectly lead to unsustainable use of resources and biodiversity degradation. As a consequence, in such situations, extra care needs to be taken before sourcing biomass in contexts of high food insecurity of the populations.

Steps in the decision tree

(1) Download the data on the evolution on undernourishment from the most recent FAO's report on the "Achievement of the Millenium Development Goal Hunger Target" (available on line: http://www.fao.org/3/a-i4674e.pdf). Look more specifically to the recent data on the status of undernourishment in the source country.

(2) Check if the country belongs to the 15% less well performing countries or to the 25% less performing countries

The 15% less well preforming countries: more then 20% undernourishment remaining (for the last statistics: 2016) (highly likely ineffective food security policies)

Between 15% and 25% less well preforming countries: between 20 % and 12 % undernourishment remaining (for the last statistics: 2016) (likely ineffective food security policies)

(3) If the country belongs to the 15% or 25% less performing on combatting of undernourishment, or if the analysis of the data shows a reason of concern:

ACTION – If the country fails to deliver on a reasonable level of combatting of undernourishment, then food security policies are potentially ineffective and evaluation of sourcing of biomass must be conducted with great care.

Sub-action 1: obtain more information on the evolution/ongoing efforts at the country level for combatting undernourishment and verify to the best extent possible potential conflicts between use of biomass and land allocation for local livelihoods. If the worrisome governance situation is confirmed consider alternative source locations. If the company is already active in the country, consider sub-action 2

Sub-action 2: envision the feasibility of voluntary mitigation measures to strengthen the governance framework, as related to quality of monitoring, transparency and accountability of food security governance. Possible governance supporting measures that might be considered (amongst others) are

- clear public statements by the companies on its engagement in favour of land use for local food security
- regular reporting by the companies on its efforts to verify the absence of conflicts between use of biomass and land allocation for local livelihoods
- fostering companies' suppliers engagement to transparent decision making on how land use decisions are taken into account land allocation for local livelihoods
- seen the extreme poor performance of the country on the combatting of undernourishment, careful monitoring of the evolution of land allocation policies for local livelihoods in the country. If the worrisome situation persists, actively seek for alternative sourcing locations in other countries.

STEP 4. Assess the level of corruption

Rationale: High levels of corruption (such as bribes or tax evasion) are a key problem for responsible investment, as it creates uncertainty pertaining to the effective implementation by the government of the various policies pertaining to conservation of biodiversity and its sustainable use.

Steps in the decision tree

(1) Download the data on "control of corruption" from the most recent World Bank "Worldwide Governance Indicators" (available on line: http://info.worldbank.org/governance/wgi/#home).

(2) Check if the country belongs to the 15% less well performing countries or to the 25% less performing countries

The 15% less well preforming countries: a value below -1 for the control of corruption indicator (on a scale from -2,5 to 2,5) (based on the data for 2017)

Between 15% and 25% less well preforming countries: a value between -0,8 and -1 for the control of corruption indicator (on a scale from -2,5 to 2,5) (based on the data for 2017)

(3) If the country belongs to the 15% or 25% less performing on control of corruption, or if the analysis of the data shows a reason of concern:

ACTION – If the country fails to deliver on a minimum reasonable level of control of corruption, then anticorruption policies are potentially very ineffective and evaluation of potential corruption must be conducted with great care and governance failures mitigated to a certain extent, if possible.

Sub-action 1: obtain more information on the evolution/ongoing efforts at the country level for combatting corruption (quality of monitoring of corruption cases, transparency of the governments' actions, accountability of its decisions) ; if the worrisome governance situation is confirmed consider alternative source location or mitigation measures (cf. sub-action 2).

Sub-action 2: envision the feasibility of voluntary mitigation measures to strengthen the governance framework, as related to quality of monitoring, transparency and accountability of transactions by the government and private actors. Possible governance supporting measures that might be considered (amongst others) are

- clear public statements by the companies on the engagement against corruption
- transparency on the companies' structure (including subsidiaries)
- transparency on taxable revenue generated in the source country
- a clear within company policy on gifts, hospitality and expenses.

7 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
(5) Implementation of the proposed decision tree tool in respect to country level governance in an online accessible web application

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) 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

8 References

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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,AR	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,US	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 % 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)
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 % 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)
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