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Follow up on the post-2015 development agenda

Monitoring progress towards a sustainable development goal on land degradation and associated target

Monitoring the contribution of sustainable land use and management to climate change

adaptation/mitigation and to the safeguarding of biodiversity and ecosystem services

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The UNCCD reporting and review process in view of the post-2015 development agenda

Improving the procedures for communication of information as well as the quality and formats of reports to be submitted to the Conference of the Parties

Refinement of the UNCCD monitoring and evaluation framework in view of the post-2015 development agenda: strategic objectives 1, 2 and 3

Note by the secretariat

Summary

By its decision 22/COP.11, the Conference of the Parties established a monitoring and evaluation approach consisting of: (a) indicators; (b) a conceptual framework that allows the integration of indicators; and (c) indicators sourcing and management mechanisms at the national/local level.

The Science-Policy Interface (SPI), established by decision 23/COP.11, took up as part of its work programme 2014–2015 matters relating to monitoring and assessment.

This document contains two main parts. The first part (chapter II) contains the progress report of the secretariat on the testing conducted to assess the feasibility of the monitoring and evaluation approach and the procedures established by decision 22/COP.11. Since the testing is being conducted within the framework of the Land Degradation Neutrality (LDN) Project, chapter II also explores how the monitoring and evaluation approach and related progress indicators could be used to monitor progress towards a sustainable development goal on land degradation and associated target. The Committee on

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Science and Technology (CST) and the Committee for the Review of the Implementation of the Convention will be invited to discuss the recommendations contained in chapter II since these have an impact on the next reporting and review cycle.

The second part (chapter III) contains the report of the SPI on objective 1 of its work programme 2014–2015. The SPI explored the potential of sustainable land management to achieve the goals of the United Nations Convention to Combat Desertification while simultaneously addressing the objectives of the other Rio conventions. The CST will be invited to consider the proposals of the SPI contained in chapter III as approaches to maximize synergies among the Rio conventions through to the integration of relevant monitoring and evaluation aspects.

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I. Background

1. By its decision 22/COP.11, the Conference of the Parties (COP) established a monitoring and evaluation approach that consists of: (a) a minimum set of ‘progress indicators’ to track progress made towards strategic objectives 1, 2 and 3 of the 10-year strategic plan and framework to enhance the implementation of the Convention (2008–2018) (The Strategy);¹ (b) a conceptual framework that allows the integration of indicators; and (c) indicators sourcing and management mechanisms at the national/local level.

2. The approach, which was developed by the Ad Hoc Advisory Group of Technical Experts on Impact Indicator Refinement (AGTE), which was established by decision 19/COP.10, was designed to be both scientifically based and capable of reducing the reporting burden of country Parties.²

3. In fact, the COP decided that reporting is required only for those indicators for which standardized global datasets that can be disaggregated to the subnational level exist and requested the secretariat to provide affected country Parties with national estimates of each respective metric(s)/proxy(ies). The COP also urged affected country Parties to subsequently verify or replace these national estimates using data sourced/computed nationally/locally.

4. The COP further encouraged affected country Parties to complement the set of common progress indicators with formal and narrative indicators at national/local scale and to establish targets using the progress indicators adopted in decision 22/COP.11.

5. Finally, the COP requested the secretariat to adapt the current reporting protocol of the performance review and assessment of implementation system (PRAIS) in line with decision 22/COP.11, assess the feasibility of the adopted monitoring and evaluation approach through testing and report on the outcomes of the testing exercises to the Committee on Science and Technology (CST) at its twelfth session (CST 12).

6. The Science-Policy Interface (SPI), established by decision 23/COP.11, took up as part of its work programme 2014–2015 matters relating to monitoring and assessment.³ In particular, objective 1 of the SPI work programme was to “Bring to the other Rio conventions the scientific evidence for the contribution of sustainable land use and management to climate change adaptation/mitigation and to safeguarding biodiversity and ecosystem services”.

7. This document contains two main parts:

(a) Chapter II contains the preliminary outcomes of the testing conducted by the secretariat in accordance with decision 22/COP.11. Since the testing is being conducted within the framework of the Land Degradation Neutrality (LDN) Project, the monitoring and evaluation approach is being assessed not only for its feasibility for reporting on progress in the implementation of the Convention, but also for its applicability to LDN targets. The conclusions and recommendations contained in chapter II have a direct impact on the next reporting and review cycle starting in 2016. They are therefore brought to the attention of the CST and the Committee for the Review of the Implementation of the Convention (CRIC) for joint consideration, with the view of preparing a draft decision on future reporting for the twelfth session of the COP (COP 12);

¹ As contained in the annex to decision 22/COP.11.

² ICCD/COP(11)/CST/2 and Corr.1.

³ The SPI work programme for 2014–2015 was adopted at the first meeting of the SPI on 24–26 June 2014. More information on the establishment of the SPI and its work programme can be found in document ICCD/COP(12)/CST/6.

(b) Chapter III contains the outcomes of the work conducted by the SPI under objective 1 of its work programme 2014–2015.⁴ The SPI explored the potential of sustainable land management (SLM) to achieve the goals of the UNCCD while simultaneously addressing the objectives of the other Rio conventions. While the scientific evidence to support this claim is summarized in document ICCD/COP(12)/CST/INF.1, chapter III of this document contains proposals developed by the SPI to maximize synergies among the Rio conventions through the integration of relevant monitoring and evaluation aspects. The CST will be invited to consider the proposals made by the SPI and to make recommendations to the COP, as appropriate.

II. Testing of the monitoring and evaluation approach adopted by the Conference of the Parties at its eleventh session: preliminary outcomes

A. Assessing global data availability for the next reporting and review cycle

8. In line with decision 22/COP.11, the secretariat reviewed the availability of global datasets for the six adopted progress indicators and related metrics. The outcomes of this review are summarized in annex I.

9. The following general observations can be made:

(a) Data for the progress indicators related to strategic objective 1 (i.e. ‘trends in population living below the relative poverty line and/or income inequality in affected areas’ and ‘trends in access to safe drinking water in affected areas’) are based on primary household survey data. Although the number of household surveys has increased in countries around the world, the overall frequency and quality of data are highly variable and there are issues of consistency and comparability across and within countries. Conventional data sources are unable to yield reliable estimates at the subnational level;

(b) Data for the progress indicators related to strategic objective 2 (i.e. ‘trends in land cover’ and ‘trends in land productivity or functioning of the land’) are based on remote sensing. Available global datasets have a spatial resolution of up to 250–300 m and are therefore suitable for disaggregation at the subnational level;

(c) Concerning the progress indicators for strategic objective 3 (i.e. ‘trends in carbon stocks above and below ground’ and ‘trends in abundance and distribution of selected species’) and their associate metrics (i.e. ‘soil organic carbon stock’ and ‘Global Wild Bird Index’ respectively) data availability is as follows:

(i) Global estimates of soil organic carbon (SOC) stocks have been produced in the past to support the calculation of potential emissions of carbon dioxide from the soil under scenarios of changed land use/cover and climatic conditions,⁵ but very few global estimates are presented as spatial data. For global spatial layers on soil

⁴ Progress made with regard to the implementation of the other objectives of the SPI work programme 2014–2015 is contained in document ICCD/COP(12)/CST/6, as well as in documents ICCD/COP(12)/CST/2 and ICCD/COP(12)/CST/4.

⁵ IPCC, IPCC Guidelines for National Greenhouse Gas Inventories. Vol. 4 Agriculture, Forestry and Other Land Use. Task Force on National Greenhouse Gas Inventories (Geneva, IPCC, 2006). Available at <www.ipcc-nggip.iges.or.jp/public/2006gl/vol4.html>.

parameters that can be disaggregated at the subnational level, the most recent and complete dataset is available as the Harmonized World Soil Database;

(ii) No global datasets are available for the Global Wild Bird Index. Alternative biodiversity-related metrics relevant to the mandate of the UNCCD have been explored, but no suitable global dataset could be found.

10. Therefore, the only progress indicators for which global datasets that can be disaggregated to the subnational level exist and which, according to the procedure established in decision 22/COP.11, paragraph 7, should be considered mandatory for reporting are: ‘trends in land cover’, ‘trends in land productivity or functioning of the land’ and ‘trends in carbon stocks above and below ground’.

11. In line with decision 22/COP.11, the secretariat will make available to affected country Parties national estimates of these indicators as default data for further validation. To respond to the concerns raised by several Parties in response to Non-paper 2 entitled “Additional procedures or institutional mechanisms to assist the Conference of the Parties in regularly reviewing the implementation of the Convention” and submitted for information purposes by the CRIC at its thirteenth session,⁶ it is important to clarify that data derived from global datasets are not intended to replace national data, but simply to facilitate reporting in the absence of national data. In fact, according to decision 22/COP.11, Parties will decide whether these data (a) can be validated; (b) shall be replaced with data sourced nationally/locally; and/or (c) can be complemented by other data available at the national level.

12. Furthermore, affected country Parties will be given the possibility to and are encouraged to report, on a voluntary basis, on the other three progress indicators as well as on additional quantitative and narrative indicators based on existent data collection systems and databases at the national and subnational level.

13. The monitoring and evaluation approach adopted by decision 22/COP.11 is being tested in the framework of the LDN Project to assess its feasibility to report on progress in the implementation of the Convention as well as its applicability to LDN targets.

B. Monitoring progress towards a sustainable development goal on land degradation and associated target

14. With the support of the Republic of Korea,⁷ the secretariat is currently facilitating a pilot project to assist 16 affected country Parties⁸ from the five Regional Implementation Annexes that agreed to implement a LDN approach in the formulation, alignment and implementation of their national action programmes (NAPs). The assumption is that the various assets of the Convention (strategic objectives, action programmes and the monitoring and assessment framework adopted for progress reporting) could be used for the identification and monitoring of the achievement of tangible LDN targets at national level.

⁶ At its thirteenth session, the CRIC invited Parties to provide feedback on Non-paper 2 entitled “Additional procedures or institutional mechanisms to assist the Conference of the Parties in regularly reviewing the implementation of the Convention” by 1 June 2015. The Bureau of the CRIC, at its meeting on 11–12 June 2015, decided to postpone the deadline to 1 July 2015. Building on the Non-paper 2, the secretariat prepared document ICCD/CRIC(14)/10.

⁷ Under the Changwon Initiative.

⁸ Algeria, Armenia, Belarus, Bhutan, Chad, Chile, Costa Rica, Ethiopia, Grenada, Indonesia, Italy, Myanmar, Namibia, Panama, Senegal and Turkey.

15. The objective of the project is that a representative sample of affected country Parties translates the LDN global goal into national voluntary targets, making use of the implementation framework and the monitoring and assessment mechanisms established within the UNCCD process. The LDN Project ultimately aims at contributing to an agreement among Parties by which affected country Parties decide to adopt their own national voluntary target to achieve LDN.

16. In accordance with the stipulations of decision 22/COP.11, the secretariat – in partnership with the Joint Research Centre of the European Commission – identified reliable global sources and assessed the availability of data for the progress indicators (see also chapter II.A above). Based on the review of existing global datasets, participants in the inception meeting of the LDN Project decided to use the following set of progress indicators in a tiered approach:

Tier 1:	Trends in land use/cover
Tier 2a:	Trends in land productivity
Tier 2b:	Trends in soil organic carbon stocks

17. This indicator framework is based on the synoptic utilization of the three indicators in a tiered approach. Tier 1 measures trends in land use/cover, especially for critical transitions (e.g. from semi-natural land cover classes to cropland and to artificial surfaces); Tier 2a measures trends in land productivity, is a proxy of land degradation and can be used to assess the application of conservative land management measures;⁹ and Tier 2b measures trends in SOC stocks, is intrinsically connected to soil quality and allows for the evaluation of the ultimate consequences of LDN policies on the evolution of the national stable organic carbon capital.¹⁰

18. In line with the approach established in decision 22/COP.11, the monitoring of these indicators needs to take place within the context of broader monitoring and accountability strategies. Complementary indicators at national to subnational scale that monitor issues relevant to specific national contexts are crucial to identify and implement the best

⁹ Although apparent loss of net primary productivity (NPP) is often associated with land degradation, it does not necessarily indicate land degradation (e.g. less intensive agriculture may decrease yields in the short term, but improve environmental quality in the long term), nor does an increase in NPP always result in improvement (e.g. shrub encroachment in natural grasslands).

¹⁰ With reference to the report of the Open Working Group of the General Assembly on Sustainable Development Goals (document A/68/970), a note suggesting the use of the indicators framework described in paragraphs 16 and 17 of this document to measure progress on the sustainable development goal (SDG) 15 and its target 15.3 was submitted to the Committee for the Coordination of Statistical Activities. In March 2015, the United Nations Statistical Commission (UNSC) issued a technical report for consideration by the delegates in intergovernmental negotiations on the post-2015 development agenda, which includes an assessment of proposed provisional indicators. The global indicator ‘trends in land degradation’, based on the synoptic utilization of the three indicators ‘trends in land use/cover’, ‘trends in land productivity’ and ‘trends in soil organic carbon stocks’ is listed and scored under SDG target 15.3 (indicator 15.3.1). The development of the SDG indicator framework will follow a multistage process culminating in March 2016 in the final recommendations of the UNSC. The Inter-agency and Expert Group on Sustainable Development Goal Indicators had its first meeting 1–2 June 2015 to kick off this process.

strategies at the local level. For instance, socio-economic indicators can provide complementary information to interpret land degradation trends.

19. The LDN Project has provided the participating countries with data for the set of indicators (vector, raster and numerical data) and the countries are in the process of testing the indicators framework. According to the methodology proposed by the Project, countries are to follow a five-step approach leading to the identification of LDN targets:

(a) Step 1: Identifying, mapping and quantifying the negative trends indicating signs and risks of land degradation;

(b) Step 2: Identifying land management options that can stop or reverse the negative trends through: (i) preventing, avoiding or minimizing land degradation processes; and/or (ii) rehabilitating or restoring degraded land;¹¹

(c) Step 3: Reviewing the national action programme in order to ascertain if its legal, financial, scientific and administrative frameworks and land management options would stop and/or reverse the identified negative trends efficiently and in a timely manner;

(d) Step 4: Setting LDN national voluntary targets (expressed in relation to measureable indicators) in terms of time and resources needed for the implementation of the identified management and policy options.

20. Participating countries are currently in the process of identifying land degradation trends using the approach proposed in the above paragraph. In particular, they are being assisted by the Project's management team in identifying critical transitions of land use/cover as well as areas showing declining productivity. Each country would then have the choice of selecting the corrective measures that would be most effective given their specific socio-economic conditions.

21. At the time of publication of this document, no country has reached the step of setting LDN targets (step 4). Additional information will be provided to Parties at COP 12 through information materials and specific events where the participating countries would share their experiences, opinions and suggestions on how to bring this matter forward.

C. Conclusions and recommendations

22. Over the course of 2015, and taking advantage of the ongoing LDN Project, the secretariat has tested the procedure established by decision 22/COP.11 with regard to progress indicators, and particularly those relating to (a) the reporting requirements for indicators (see decision 22/COP.11, para. 7) by checking the availability of standardized global datasets that can be disaggregated to the subnational level; and (b) the provision of national estimates to affected country Parties (see decision 22/COP.11, para. 8), compiling indicators where such datasets were available, for the countries participating in the LDN Project.

23. Countries participating in the LDN Project are currently reviewing the data made available by the secretariat, and will decide whether these data (a) can be validated; (b) shall be replaced with data sourced nationally/locally; and/or (c) can be complemented by other data available at the national level.

24. The initial identification, compilation and computation of data for progress reporting for the 16 LDN countries has taken approximately four months (February–

¹¹ These are the options proposed by the Intergovernmental Working Group on Land Degradation Neutrality (see document ICCD/COP(12)/4).

May 2015) and required the technological and methodological assistance of a specialized institution. It is expected that a further approximately two months will be required for the countries to complete the review and validation process. In addition, in order to respond to the request in decision 22/COP.11 to establish national targets using the selected indicators (see decision 22/COP.11, para. 12) and to fully and formally link national reporting to action programme alignment efforts (see decision 22/COP.11, para. 11), Parties may need additional time, specific capacities and dedicated human and financial resources.

25. Based on the preliminary results of the ongoing testing phase, it is expected that the compilation of national estimates for the actual reporting and review process, and the review and use of these data for national reporting and target-setting could take place in 2016, under the condition that relevant institutions assist with the provisions of relevant datasets and related methodologies.

26. Taking paragraphs 22–25 into account as well as the proposals contained in document ICCD/COP(12)/4 on the post-2015 development agenda and document ICCD/CRIC(14)/10 on the reporting and review process, Parties at CST 12 and CRIC 14, with the view of preparing a draft decision on future reporting for the COP, may:

(a) Decide that reporting is required for the following three progress indicators: ‘trends in land cover’, ‘trends in land productivity or functioning of the land’ and ‘trends in carbon stocks above and below ground’;

(b) Request the secretariat, in cooperation with relevant specialized institutions, to:

(i) Compile and make available to affected country Parties national estimates of the metrics/proxies associated with these indicators from the identified global datasets as default data for validation, in accordance with the procedure established in decision 22/COP.11;

(ii) Prepare methodological guidelines and provide technical assistance to affected country Parties on the compilation and use of such default data, including for the preparation of national voluntary targets;

(c) Decide that affected country Parties shall provide timely feedback on the default data and the proposed methodology to formulate national voluntary targets using the monitoring and assessment indicators framework and complete the reporting and target-setting exercise by December 2017;

(d) Invite relevant specialized institutions to provide access to data and methodologies and assist the secretariat in the compilation and provision of data/national estimates as well as their review, as mentioned in sub-items (b) and (c) above.

III. Monitoring the contribution of sustainable land management to climate change adaptation and climate change mitigation, and to the safeguarding of biodiversity and ecosystem services

27. Building and maintaining the health and productivity of the land, and thereby sustaining the livelihoods of rural communities, are the fundamental goals of the UNCCD. The pursuit of the UNCCD’s goals simultaneously addresses the goals of the other Rio conventions (Convention on Biological Diversity (CBD) and the United Nations Framework Convention on Climate Change (UNFCCC)): healthy, productive land stores

carbon in soil and supports biomass production, and sustaining the productivity of the land reduces the pressure for expansion of agriculture, thus reducing the likelihood of deforestation and other land conversion; this helps protect the carbon stock and biodiversity of natural ecosystems. SLM practices (which include the judicious use or replacement of chemical fertilizers and pesticides as well as the enhancement of soil organic matter) enhance biodiversity on agricultural land and minimize adverse impacts on natural ecosystems, thus contributing to climate change mitigation and the conservation of biodiversity on-farm and off-farm. Furthermore, SLM practices that preserve and build soil organic matter assist in climate change adaptation by reducing vulnerability to climate change, for example by enhancing soil water holding capacity. SLM thus also plays a major role in addressing the challenge of food security. Therefore managing land degradation through SLM constitutes an intersection of interests between the Rio conventions and the sustainable development goals (SDGs), and promoting the sustainable management of agro-ecosystems will help tackle these major issues.

28. A larger SPI assessment, contained in document ICCD/COP(12)/CST/INF.1, summarizes the considerable scientific evidence that SLM also contributes to the objectives of the UNFCCC (climate change adaptation and mitigation) and the strategic goals of the CBD (safeguarding biodiversity and ecosystem services) and its associated Aichi Biodiversity Targets.

29. One approach to maximizing the synergies among the three Rio conventions is to ensure the integration of the monitoring and evaluation aspects that are relevant to the three conventions.

30. Given the synergies between the conventions with respect to land use and management (outlined in paragraph 27), the SPI explored whether the three land-based progress indicators adopted in decision 22/COP.11 might also be useful for indicating the contribution of agricultural, forest and other land to climate change adaptation and mitigation and to biodiversity conservation. The findings of this work are reported in chapter III.A.

31. In addition, the Scientific and Technical Advisory Panel (STAP) of the Global Environment Facility (GEF) proposed a framework approach for the assessment of resilience that captures synergies across the Rio conventions in areas of common interest. The findings of this work are reported in chapter III.B.

A. Potential of land-based indicators for the joint monitoring of the three Rio conventions

32. The scientific basis for the integrative potential of the three land-based UNCCD progress indicators relative to each other and with respect to land degradation, climate change and biodiversity loss is summarized in table 1.

Table 1

The integrative potential of the three United Nations Convention to Combat Desertification land-based progress indicators relative to each other and with respect to land degradation, climate change and biodiversity

<i>Land-based indicator</i>	<i>Integrative basis</i>
Trends in land cover^a	Land cover describes the distribution of vegetation types and reflects the human use of the land for agriculture and forestry and human settlements. Changes in land cover provide a first indication of the degradation or restoration/rehabilitation of land as well as land-use change and alteration to natural habitats. Decline in land cover can indicate loss of protective vegetative cover, which may result from, and further exacerbate, land degradation and loss of soil quality. Conversely, positive trends in land cover can indicate reversal of land degradation, and the balance between declines and increases in land cover can indicate land degradation neutrality. Changes in the distribution of natural vegetation types can provide a basis to monitor impacts of climate change on biodiversity as well as determine the capacity of natural systems to adapt to climate change. Land cover changes can alter the exchange of energy between the land and atmosphere and affect atmospheric concentrations of greenhouse gases, which can lead to climate change. Change in land cover modifies the services provided to human society (e.g. the provision of food and fibre and cultural services such as recreational opportunities). It also signifies changes in supporting services (e.g. nutrient cycling) and regulating services (e.g. water purification) provided by natural and managed ecosystems. Land cover is a primary input into mapping land use as well as the extent of biomes, ecosystems and habitats, which assists in the interpretation of trends in land productivity and carbon stocks. Land cover data are required for modelling ecosystem dynamics and biogeochemical cycling, and for assessing biomass change (due to land use and management practices and/or natural processes), which in turn enables the measurement of carbon sequestration or loss. Land cover is an essential input to the assessment of land degradation/desertification as well as the characterization of biodiversity, ecosystem services and ecosystem resilience. It is also used to identify land use change, and so contributes to the estimation of change in carbon stock in biomass and soil, which are important components of greenhouse gas inventories.
Trends in land productivity or functioning of the land^b	Change in land productivity indicates the long-term trend in productive capacity of the land, which reflects the net effects of change in soil quality, climate and ecosystem functioning on plant growth. Measures of productivity are also influenced in the short term by crop phenology, seasonal fluctuations and drought which must be factored out to interpret trends in productivity for monitoring land degradation trends. Productivity trends are also important for assessing the change in carbon sink strength of natural and managed systems, and thus their contribution to climate change mitigation. Furthermore, maintaining and enhancing the productivity of agricultural soils reduces the pressure for expansion of agriculture and thus minimizes impacts on natural ecosystems. Thus, long-term monitoring of changes in land productivity, interpreted together with additional data (e.g. to factor out seasonal weather patterns and/or changes in irrigation or fertilizers practices), can indicate the loss or degradation of habitats as well as the restoration or rehabilitation of land and soil quality.
Trends in carbon stocks above and below ground^c	Changes in carbon stocks of biomass and soil reflect the integration of processes affecting plant growth and losses from terrestrial organic matter pools. Thus they reflect trends in ecosystem function, soil health and climate, as well as land use and management. This helps detect trends in the processes leading to and the management of climate change, desertification/land degradation and biodiversity loss. Change in soil organic carbon is largely influenced by anthropogenic activities, such as land-use change, and management practices that influence the productive potential of the soil. Soil organic carbon is an indicator of overall soil quality associated with soil nutrient cycling, soil aggregate stability and soil structure, with direct implications for water infiltration, vulnerability to erosion and ultimately the productivity of vegetation, and in

<i>Land-based indicator</i>	<i>Integrative basis</i>
	agricultural contexts, yields. The soil carbon pool plays the role of both a source and a sink of carbon and thus is relevant to the estimation of carbon fluxes. Soil carbon stocks reflect the balance between organic matter inputs (dependent on plant productivity) and losses due to decomposition through action of soil organisms and physical export through leaching and erosion. On seasonal to decadal timescales, carbon stocks of natural and managed systems may be explained largely by changes in plant biomass (known as a “fast variable”), but on longer time scales, soil carbon stocks (a “slow variable”) become a more relevant indicator of the functioning of the system, its adaptive capacity and resilience to perturbations (e.g. drought), and thus its capacity to provide ecosystem goods and services in the long term.

^a Local, national and global assessments are currently being conducted through contributing networks.

^b Methods, data, models and networks are currently available for local, national and global assessments.

^c Methods, data and models are currently under development, and contributing networks need to be established.

33. These land-based indicators may support in tandem the approaches to be adopted by the UNFCCC and the CBD for monitoring progress toward their goals and/or targets as exemplified in figures 1 and 2 contained in annex II.

34. For meeting its mitigation commitment, the UNFCCC pursues both a measurement approach by supporting the measurement of Essential Climate Variables through the Global Climate Observing System (GCOS),¹² which have the potential to serve as the observations through which indicators can be reported, and an estimation approach where detailed guidelines developed by the Intergovernmental Panel on Climate Change (IPCC) ensure the standardized application of methods to produce greenhouse gas inventories.^{13,14} For its adaptation commitment, general technical guidelines have been developed for UNFCCC national adaptation plans, which include several steps where land-based indicators may prove useful.^{15,16} The CBD has established a hierarchical framework based on its strategic plan that includes a comprehensive set of headline and outcome indicators developed to assess progress of the implementation of the 2010 Aichi Biodiversity Targets, four of which are particularly applicable to the assessment of land.^{17,18}

¹² GCOS, *Implementation Plan for the Global Observing System for Climate in Support of the UNFCCC (2010 update)* (Geneva, World Meteorological Organization, 2010). Available at: <http://www.wmo.int/pages/prog/gcos/Publications/gcos-138.pdf>.

¹³ UNFCCC decision 24/CP.19.

¹⁴ IPCC, *IPCC Guidelines for National Greenhouse Gas Inventories. Vol. 4 Agriculture, Forestry and Other Land Use. Task Force on National Greenhouse Gas Inventories* (Geneva, IPCC, 2006). Available at <http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol4.html>.

¹⁵ UNFCCC decision 5/CP.17.

¹⁶ Least Developed Countries Expert Group, *National Adaptation Plans: Technical guidelines for the national adaptation plan process* (Bonn, United Nations Framework Convention on Climate Change, 2012). Available at: https://unfccc.int/files/adaptation/cancun_adaptation_framework/application/pdf/naptechguidelines_eng_high_res.pdf.

¹⁷ CBD decision UNEP/CBD/COP/DEC/XI/3.

¹⁸ CBD, *Progress towards the Aichi Biodiversity Targets: An assessment of biodiversity trends, policy scenarios and key actions*, CBD Technical Series No. 78, (Montreal, Secretariat of the Convention on Biological Diversity, 2014). Available at: <https://www.cbd.int/doc/publications/cbd-ts-78-en.pdf>.

35. The mapping exercise depicted in figures 1 (a) and 1 (b) in annex II suggests that meeting the challenge of integrating the monitoring approaches to land into the three Rio conventions is both feasible and mutually beneficial.

36. Nonetheless, it is vitally important to emphasize that these three progress indicators alone do not capture the complexity of land dynamics or the benefits of SLM. The value of these indicators is dependent on the conceptual framework within which they are applied and interpreted, as established in decision 22/COP.11 and detailed in ICCD/COP(12)/CST/INF.1.

B. Resilience, Adaptation Pathways and Transformation Assessment (RAPTA) Framework

37. Supporting land-based adaptation and building agro-ecosystem resilience have been identified as critical initiatives that address the intersecting goals of climate change adaptation and the reduction of land degradation, and to which SLM can make a major contribution. Monitoring progress in land-based adaptation and building agro-ecosystem resilience requires the identification of relevant indicators or indicator frameworks.

38. The STAP of the GEF, responding to a request from the UNCCD secretariat, commissioned the Commonwealth Scientific and Industrial Research Organisation (CSIRO) to identify an indicator of the resilience of agro-ecosystems that could be applied at national level by the Parties to the UNCCD and could also be relevant to the CBD and UNFCCC. The CSIRO report¹⁹ reviewed the conceptual basis of the resilience assessment and proposed a framework approach to the assessment of resilience as well as the related concepts of adaptation and transformation.²⁰ The Resilience, Adaptation Pathways and Transformation Assessment (RAPTA)²¹ Framework is illustrated in figure 1 contained in annex III, and is described in detail in the CSIRO report.

39. The RAPTA is a structured, multi-stakeholder approach to understanding and assessing resilience and needs for adaptation and transformation. The RAPTA process (see figure 2 in annex III) assists users in describing and assessing the system and then identifying appropriate governance and management responses. The procedure includes four elements:

- (a) Element A: System description;
- (b) Element B: Assessing the system;
- (c) Element C: Adaptive governance and management;
- (d) Element D: Multi-stakeholder engagement.

¹⁹ O'Connell, D., Walker, B., Abel, N., Grigg, N. (2015) The Resilience, Adaptation and Transformation Assessment Framework: from theory to application. CSIRO, Australia.

²⁰ Resilience, adaptation and transformation are defined in the RAPTA framework as follows:
Resilience: The ability of a system to absorb disturbance and reorganize, so as to retain essentially the same function and structure.

Adaptation: A process of responsive change that improves the ability of a system to achieve desired goals, including by reducing vulnerability to disturbance or threats, such as climate change.

Transformation: A process of moving to a social-ecological system with a different identity, structure and functions to achieve desired goals. Often transformation is needed at one scale to maintain the resilience (or system identity) at another scale.

²¹ The framework was originally known as the Resilience Adaptation and Transformation Assessment (RATA) Framework and also the Resilience, Adaptation and Transformation Assessment and Learning Framework (RATALF).

40. The procedure assists the users in identifying the critical indicators, from the many available indicators, that should be measured to assess the status of that system. The outputs include: (1) a detailed description of the system (defining scale and identifying controlling variables and thresholds); and (2) identifying possible intervention options to adapt or transform. If the system is determined to be at risk of crossing identified thresholds, then it is desirable for the system to adapt to reduce these risks, which may relate, for example, to the projected effects of climate change. If the risks are severe, and successful adaptation is deemed unlikely or unaffordable, it may be more appropriate to transform the system. The outcomes of the assessment procedure are captured in scalable indicators: a ‘summary-action’ indicator that summarizes the results of the assessment process and provides broad guidance on the types of actions that may be appropriate to enhance resilience or transform to a new system; and ‘meta-indicators’²² that report the coverage and quality of the assessment.

41. RAPTA has been reviewed by experts from the GEF, the Rio conventions, development agencies and research institutions, including experts in natural and social sciences and economics.

1. Scientific assessment

42. Reviewers identified that RAPTA has a sound basis in resilience science and is consistent with existing frameworks developed with similar goals, but also fills a recognized gap for the assessment of resilience at national scale. Notably, RAPTA encourages a focus on underlying drivers, on linkages between biophysical and socio-economic variables, and across scales. The process of identifying ‘thresholds of concern’ encourages the understanding of the most vulnerable elements of the system, which are then the focus of interventions. The participatory adaptive management approach encourages learning and co-production of new knowledge through the collaboration of the participating stakeholders. RAPTA was commended as a practical approach to applying resilience concepts in sustainable development.

43. RAPTA was trialled in two desktop case studies in Niger and Thailand²³ using knowledge assembled from published literature, without stakeholder involvement. The desktop case studies demonstrated that where there is good knowledge of the relevant biophysical systems and social-ecological systems, it is possible to accurately identify the key driving variables and develop preliminary suggestions for adaptation responses.

44. The review process led to suggestions for refinements and the identification of elements that require further elaboration. While some further development is planned for July–December 2015, it is recognized that co-development and testing with stakeholders in an applied setting is required before the RAPTA Framework is ready for implementation by Parties to the Rio conventions.

2. Policy assessment

45. The workshop participants concluded that the RAPTA approach has the capacity to support the sustainable development goals and capture synergies across the Rio conventions in areas of common interest in the management of human/ecological systems. It can generate high-level indices that can be reported at national scale. Possible applications include:

²² Meta-indicators are high-level indicators that are universally applicable, in contrast to the individual indicators that are chosen specifically for each system assessed and may differ between systems.

²³ Grigg, N., Abel, N., O’Connell, D., Walker, B. (2015). Resilience assessment desktop case studies in Thailand and Niger. CSIRO, Australia.

(a) Developing narrative indicators²⁴ at the national and subnational scale to complement the UNCCD's progress indicators;²⁵

(b) Monitoring the GEF programme "Fostering Sustainability and Resilience for Food Security in Sub-Saharan Africa";

(c) Contributing to the UNFCCC's national adaptation plans as an iterative approach to develop strategies for climate change adaptation activities in the agricultural sector;

(d) Serving as an integration framework for monitoring and reporting at multiple scales on progress made in addressing desertification/land degradation and drought;

(e) Serving as a common conceptual framework to harmonize approaches to planning, implementation, monitoring and reporting on interventions designed to build ecosystem resilience in support of the Rio conventions, SDGs and GEF programmes.

46. The RAPTA procedure offers a flexible approach that allows the user to select those indicators of resilience that are most relevant to the system under study, thus reducing the costs and resource requirements for monitoring and reporting.

47. The meta-indicators can provide consistent and comparable reporting on the coverage and quality of assessment, relevant actions and progress for use at national scale.

48. The participatory learning process, focused on developing a joint understanding of the key variables driving the social-ecological system, facilitates the development of narratives that can improve understanding and translate this into effective action.

49. The multi-stakeholder involvement and sound conceptual basis create the foundation for interventions that are likely to have a lasting positive contribution to sustainable development.

C. Conclusions and proposals

50. With both the scientific basis and practicality of the integrative potential of the land-based progress indicators established, the next task is capitalizing on the integrative potential documented here by making it fully operational within the combined contexts of the monitoring and assessment approaches of the three Rio conventions. This will require assembling a small team of experts in monitoring and assessment that represent the scientific bodies of each of the three Rio conventions, as well as representatives from those organizations that are currently working to make datasets and methodologies behind terrestrial observations and land-based indicators both accessible and applicable.

²⁴ As recommended by the AGTE to the Parties to the UNCCD: "It is recommended that the set of common, global progress indicators be complemented with formal and narrative indicators at national/local scale that could be sourced from (predominantly) local storylines and could provide more detailed information on the level and characterization of land degradation that is specific to each context." (document ICCD/COP(11)/CST/2).

²⁵ At its eleventh session the COP adopted a set of six progress indicators (decision 22/COP.11) which will be used during the fifth reporting process in 2016.

Proposal 1: Request the secretariat, under the guidance of the CST Bureau, to produce a user guide for practitioners and decision makers to make the land-based progress indicators fully operational across the Rio conventions with respect to national monitoring and reporting

51. Many of the terrestrial observations and land-based indicators that would become part of an integrative approach can be estimated cost-effectively through remote-sensing. While the proposed workshop will provide a road map for that integration, the larger effort of international observatories is essential to the longer-term success of any integrative approach.

Proposal 2: The Science-Policy Interface, supported by the secretariat, should be invited to explore progress on the development of interoperable international observatories (for example the Global Earth Observation System of Systems being built by the Group on Earth Observations, the Global Climate Observing System, the Global Biodiversity Observing System, UNEP Live) in order to promote investment (of financial and human resources) in developing a Global Drylands Observing System, which integrates and validates remotely sensed data with ground observations, and/or ensuring that desertification/land degradation and drought and land degradation neutrality monitoring and assessment needs are fully integrated into existing efforts to systematically collect environmental observations.²⁶

52. To effectively monitor progress on the objectives and commitments of the three Rio conventions, the global effort must be integrated into efforts to meet national and/or regional goals and targets, which means support is needed for the development and integration of national indicators, considering input from indigenous and local communities and other stakeholders, as appropriate. While each of the Rio conventions already supports this concept, there are considerable advantages to working collaboratively. To be more effective, existing national observatories need to be supported by national land-related sectors (e.g. ministries of environment, education, development, infrastructure and/or agriculture) and include the building of capacities of decision makers and land users (through raising awareness of the DLDD effects on the provision of ecosystem services and their socioeconomic consequences) and training and incentives for members of rural communities to actively participate in monitoring the status of their lands.

²⁶ This proposal repeats and reinforces proposal 21 developed by the SPI based on the outcomes of the UNCCD 3rd Scientific Conference and contained in document ICCD/COP(12)/CST/2.

Proposal 3: Parties are invited to support and incentivize the establishment or the expansion, as applicable, of integrated national observatories to assess the status of land degradation and the impact of climate change, sustainable land management, and land-based adaptation, and to contribute actively to common global reporting initiatives in relation to the state of the land.²⁷

53. Despite much being known about individual processes and synergies between impacts of land degradation, climate change, and loss of biodiversity, as highlighted in document ICCD/COP(12)/CST/INF.1, uncertainties remain regarding interactions among these processes, the social and biophysical systems, and the role of SLM strategies in climate change adaptation and mitigation and the protection of biodiversity. Literature on land-based climate change adaptation is scarce compared to the published knowledge addressing climate change mitigation. Some land-based climate change adaptation strategies may be inconsistent with SLM, and hence it is necessary to consider synergies and trade-offs in devising SLM practices that can be considered land-based climate change adaptation. Furthermore, it is important to consider the scale of implementation of an SLM practice to ensure that effects are recognized at a system level (e.g. whole catchment hydrological impacts).

Proposal 4: The Science-Policy Interface, supported by the secretariat, is invited to review, as part of its work programme for 2016–2017, sustainable land management (SLM) practices that contribute to climate change mitigation and qualify as climate change adaptation practices. This review should also evaluate incentives and disincentives for the adoption of SLM practices at different scales and include the local knowledge of land users in the drylands.

²⁷ This proposal repeats and reinforces proposal 22 developed by the SPI based on the outcomes of the UNCCD 3rd Scientific Conference and contained in document ICCD/COP(12)/CST/2.

54. The CST is also encouraged to consider the following proposals made by the SPI to support land based adaptation and build agro-ecosystem resilience through SLM:

Proposal 5: Parties and relevant organizations and institutions are encouraged to support the refinement and testing of the Resilience, Adaptation Pathways and Transformation Assessment (RAPTA) Framework in relevant projects; and

Proposal 6: The SPI is encouraged to:

(a) Continue to collaborate with the Scientific and Technical Advisory Panel of the Global Environment Facility to support the further development and pilot testing of RAPTA and provide advice and guidance where relevant;

(b) Promote the application of RAPTA as an example of a common approach to planning, monitoring and reporting on land-based adaptation and agro-ecosystem resilience;

(c) Consider, as part of its work programme 2016-2017, how the RAPTA approach can be applied in its future work on developing guidance for the United Nations Convention to Combat Desertification (UNCCD) on operationalizing the land degradation neutrality target;

(d) Consider how the RAPTA approach could contribute to the development of quantitative and narrative indicators at the national/subnational level to complement the UNCCD progress indicators.

55. Table 2 below contains an estimate of the financial requirements for the implementation of the activities by the secretariat referred to in paragraph 50 above, from extra budgetary resources.

Table 2
Financial implications

<i>Activity</i>	<i>Cost (euros)</i>	<i>Possible source of funding</i>
The secretariat prepares a user guide for using land-based progress indicators across the Rio conventions	30,000	This activity will be funded through already secured extrabudgetary funds
Total extrabudgetary resources	30,000	

Annex I

[English only]

Availability of global datasets

<i>Indicator and related metrics</i>	<i>Global datasets</i>	<i>Disaggregation level</i>
Trends in population living below the relative poverty line and/or income inequality in affected areas Metrics: poverty severity (or squared poverty gap), income inequality	Data are based on primary household survey data obtained from government statistical agencies and World Bank country departments. Data are made available by the Development Research Group of the World Bank. < http://iresearch.worldbank.org/PovcalNet/index.htm >	National estimates only. Geographically disaggregated data is not available.
Trends in access to safe drinking water in affected areas Metric: proportion of population using an improved drinking water source	Data are based on primary household surveys and national censuses. Data are made available by the Joint Monitoring Programme for Water Supply and Sanitation of the World Health Organization and the United Nations Children's Fund. < http://www.wssinfo.org/ >	National, rural and urban estimates. Geographically disaggregated data is not available.
Trends in land cover Metric: vegetative land cover	Data are based primarily on remote sensing. A review of available datasets is contained in Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Gas Inventories. ^a Three global land cover maps for the epochs 2000, 2005 and 2010 at 300 m spatial resolution have been released in 2014 by the Climate Change Initiative Land Cover team of the European Space Agency. The 2015 epoch is under preparation. < http://www.esa-landcover-cci.org/?q=node/158 >	Data can be disaggregated at the subnational level
Trends in land productivity or functioning of the land Metric: land productivity dynamics	Data are based primarily on remote sensing databases of the Normalized Difference Vegetation Index (NDVI) and other vegetation indices/variables derived from different platforms and sensors. A global dataset of land productivity dynamics is made available by the Joint Research Centre of the European Commission. This dataset has been derived from a 15-year time series (1998 to 2012) of global NDVI observations composited in 10-day intervals at a spatial resolution of 1 km.	Data can be disaggregated at the subnational level

<i>Indicator and related metrics</i>	<i>Global datasets</i>	<i>Disaggregation level</i>
Trends in carbon stocks above and below ground Metric: soil organic carbon stock	Data is available as the Harmonized World Soil Database, a 30 arc-second raster database with over 15,000 different soil mapping units that combines existing regional and national updates of soil information worldwide with the information contained within the 1:5,000,000 scale Soil Map of the World of the Food and Agriculture Organization of the United Nations and the United Nations Educational, Scientific and Cultural Organization. < http://webarchive.iiasa.ac.at/Research/LUC/External-World-soil-database/HTML/ >	Data can be disaggregated at the subnational level
Trends in abundance and distribution of selected species Metric: Global Wild Bird Index	No global datasets are available. Data for the Global Wild Bird Index are available for only 18 European countries, plus regional data for North America and Europe. Alternative biodiversity-related metrics relevant to the mandate of the UNCCD have been explored and no suitable global dataset could be found.	Not available

^a IPCC, IPCC Guidelines for National Greenhouse Gas Inventories. Vol. 4 Agriculture, Forestry and Other Land Use. Task Force on National Greenhouse Gas Inventories (Geneva, IPCC, 2006). Available at <<http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol4.html>>.

Annex II

[English only]

Potential for the integration of the United Nations Convention to Combat Desertification land-based progress indicators into the monitoring approaches of the other Rio conventions

1. Figure 1 depicts a schematic of how the United Nations Convention to Combat Desertification (UNCCD) land-based progress indicators might be integrated into the United Nations Framework Convention on Climate Change (UNFCCC) approaches to monitoring, proceeding from observations to indicators (including synergistic Convention on Biological Diversity (CBD) indicators) to objectives and commitments. All processes and potential links in the schematic are either already operational or are feasible. The schematic maintains source terminology and monitoring frameworks as far as possible.
2. Figure 2 depicts a schematic of how the UNCCD land-based progress indicators might be integrated into the CBD approach to monitoring, proceeding from observations (including synergistic UNFCCC Essential Climate Variables observations) to targets/strategic goals. The schematic maintains source terminology and monitoring frameworks as far as possible. All processes and potential links in the schematic are either already operational or are feasible. The two CBD strategic goals (depicted on the far right) addressed are Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use; and Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity.

Figure 1

Schematic of how the UNCCD land-based progress indicators might be integrated into the UNFCCC approaches to monitoring

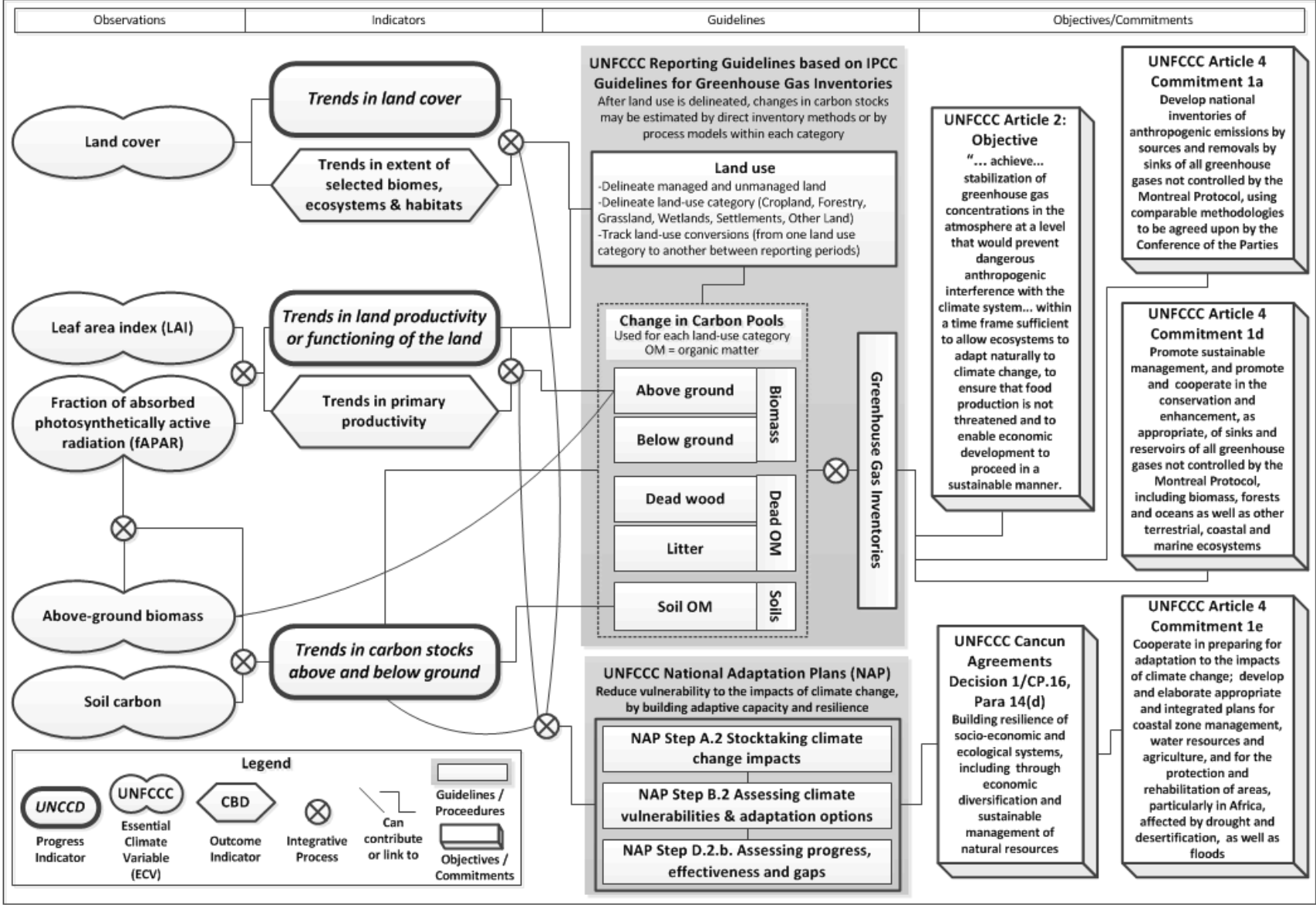
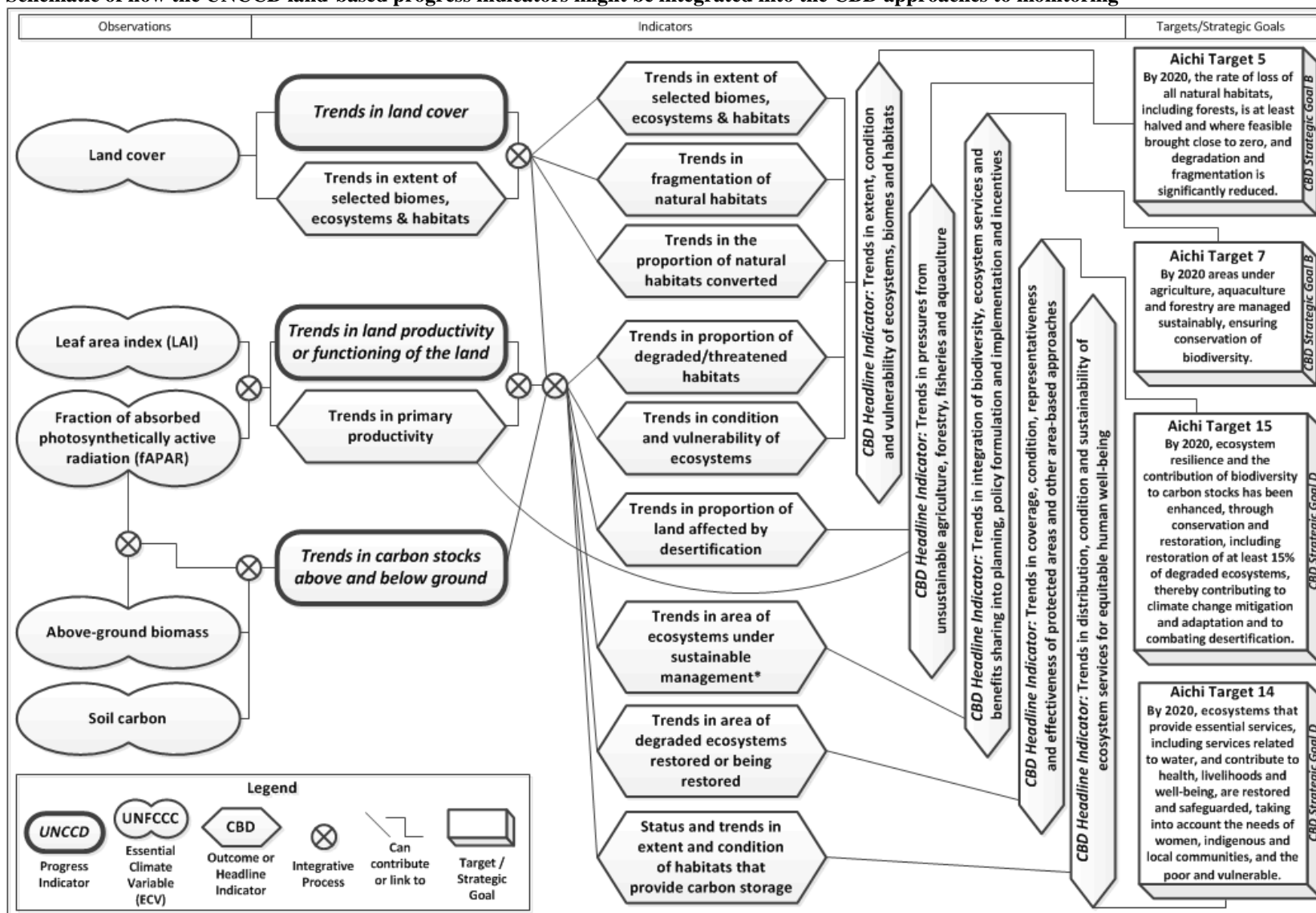


Figure 2

Schematic of how the UNCCD land-based progress indicators might be integrated into the CBD approaches to monitoring



Sources

- CBD. 2012. Decision 3, COP-XI. Monitoring progress in implementation of the Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets. UNEP/CBD/COP/DEC/XI/3 Hyderabad, India, 8-19 October 2012
- CBD. 2014. Progress towards the Aichi Biodiversity Targets: An assessment of biodiversity trends, policy scenarios and key actions. Technical Series No. 78, Global Biodiversity Outlook 4 (GBO-4), Secretariat of the Convention on Biological Diversity, Bonn, Germany.
- GCOS, 2010. Implementation plan for the global observing system for climate in support of the UNFCCC (2010 update). GCOS Rep. 138, 186 pp. <http://www.wmo.int/pages/prog/gcos/Publications/gcos-138.pdf>.
- IPCC. 2006. IPCC Guidelines for National Greenhouse Gas Inventories. Vol. 4 Agriculture, Forestry and Other Land Use. Task Force on National Greenhouse Gas Inventories. Intergovernmental Panel on Climate Change (IPCC), Geneva. <http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol4.html>.
- UNCCD. 2013. Decision 22/COP.11. Advice on how best to measure progress on strategic objectives 1, 2 and 3 of The Strategy. ICCD/COP(11)/23/Add.1, 20 September 2013. United Nations Convention to Combat Desertification, Bonn.
- UNCCD. 2013. Refinement of the set of impact indicators on strategic objectives 1, 2 and 3. Recommendations of the ad hoc advisory group of technical experts ICCD/COP(11)/CST/2 and Corr.1. 10 July 2013. United Nations Convention to Combat Desertification, Bonn.
- UNFCCC. 2000. Decision 5/CP.5 Research and systematic observation FCCC/CP/1999/6/Add.1 2 February 2000 UN Framework Convention on Climate Change, Bonn.
- UNFCCC. 2013. Decision 24/CP.19 Revision of the UNFCCC reporting guidelines on annual inventories for Parties included in Annex I to the Convention FCCC/CP/2013/10/Add.3. 31 January 2014. UN Framework Convention on Climate Change, Bonn.
- UNFCCC. 2011. Decision 5/CP.17 National adaptation plans. FCCC/CP/2011/9/Add.1 11 December 2011. UN Framework Convention on Climate Change, Bonn.
- UNFCCC. 2012. National Adaptation Plans: Technical guidelines for the national adaptation plan process. Least Developed Countries (LDC) Expert Group. UN Framework Convention on Climate Change, Bonn

Annex III

[English only]

Resilience, Adaptation Pathways and Transformation Assessment Framework

Figure 1

Overview of RAPTA. Dotted outlines indicate elements that require further development

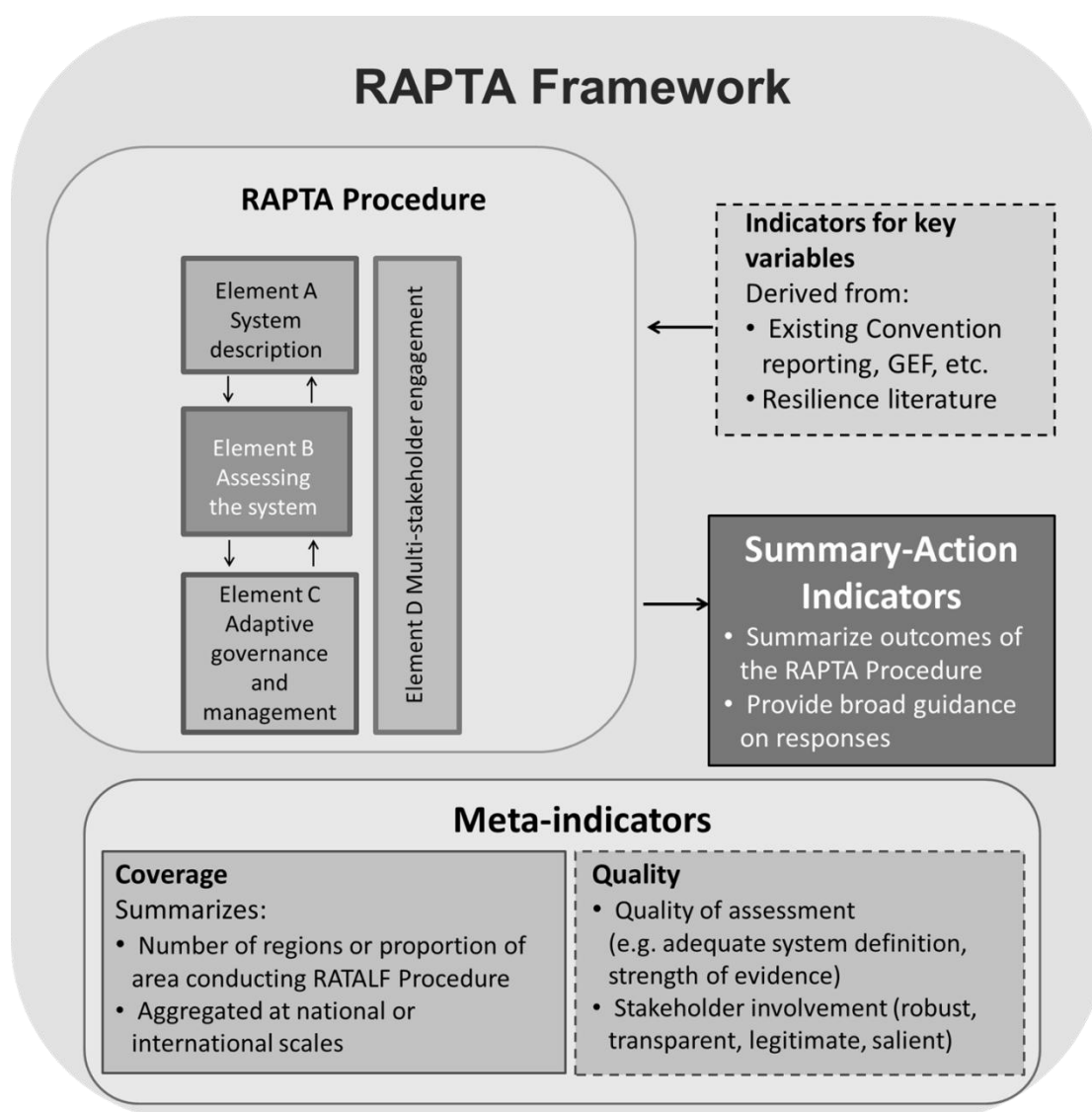


Figure 2
Elements of the RAPTA process

