

SUBSIDIARY BODY ON SCIENTIFIC, TECHNICAL
AND TECHNOLOGICAL ADVICE

Seventeenth meeting

Montreal, 14-18 October 2013

Agenda items 3 and 4

**SCIENTIFIC AND TECHNICAL NEEDS RELATED TO THE IMPLEMENTATION OF THE
STRATEGIC PLAN FOR BIODIVERSITY 2011-2020**

Draft recommendation submitted by the Chair

The Subsidiary Body on Scientific, Technical and Technological Advice,

Recalling decision XI/13 B, paragraph 2, in which the Conference of the Parties requested the Subsidiary Body to identify scientific and technical needs related to the implementation of the Strategic Plan for Biodiversity 2011-2020 and to report thereon to the Conference of the Parties at its twelfth meeting,

Also recalling that the format for the seventeenth meeting of Subsidiary Body provided for panel discussions, introductory presentations and question and answer sessions to facilitate in-depth consideration of the issues on the agenda,

1. *Notes with appreciation* the reports prepared by the Executive Secretary in accordance with decision XI/13 B, paragraph 1, contained in documents UNEP/CBD/SBSTTA/17/2, UNEP/CBD/SBSTTA/17/2/Add.1, UNEP/CBD/SBSTTA/17/2/Add.2, UNEP/CBD/SBSTTA/17/2/Add.3, UNEP/CBD/SBSTTA/17/2/Add.4, and UNEP/CBD/SBSTTA/17/3, and, after considering them, found key scientific and technical needs related to the implementation of the Strategic Plan for Biodiversity 2011-2020;

2. These needs were considered in the overarching context of the vision of the Strategic Plan for Biodiversity 2011-2020 "Living in Harmony with Nature". Any actions/measures to address these needs should focus on sharing and applying existing tools which may require adaptation to specific national circumstances, respecting sovereign right of countries to choose their own approaches, visions, models and tools. Addressing these needs will require strengthening scientific and technical capacities and new, predictable and adequate funding;

3. The key scientific and technical needs include:

(a) *Social science* - The need for better ways to draw on social sciences to motivate choices consistent with the objectives of the Strategic Plan for Biodiversity 2011-2020 and to develop new approaches through *inter alia* better understanding of behavioral change, production and consumption patterns, policy development, and the use of non-market tools. The need for more effective communication, education and public awareness to be spread more widely through school systems and other channels and to devise communication and awareness strategies on biodiversity, complementing communication, education and public awareness efforts with other perspectives including research on intercultural communication experiences;

(b) *Data and information* - The need for more accessible, affordable, comprehensive, and reliable data and information streams through, *inter alia*, facilitated access to remote sensing, better use of *in situ* observations, citizen science, modelling, biodiversity monitoring networks, and through better application of data standards and interoperability to data acquisition and management: to produce policy relevant products, including indicators and scenarios to inform decision-making;

(c) *Planning and mainstreaming* - The need for improvement in and better use of appropriate planning tools and approaches for mainstreaming in achieving the Strategic Plan through, *inter alia*: inclusion of biodiversity concerns in spatial planning, including integrated land use and coastal planning; biodiversity and ecosystem services valuation; and mainstreaming biodiversity into sustainable development;

(d) *Policy* - The need for better integration of science and policy-making and improved science-policy interfaces, particularly at local and national levels and for resourcing IPBES, and improved and wider use of tools to promote policy coherence and policy evaluation and to produce scenarios and options relevant to policymakers;

(e) *Maintenance and restoration of ecosystems* - The need for better understanding of ecosystem processes and functions and their implications for ecosystem restoration, ecological limits, tipping points, socio-ecological resilience and ecosystem services; and improved methodologies and indicators for monitoring ecosystem resilience and recovery;

(f) *Economic instruments* - The need for better understanding of the performance of economic instruments and their wider use in achieving the objectives of the Strategic Plan for Biodiversity 2011-2020, taking into account national socio-economic conditions, and improved guidance and tools for the identification, elimination, phasing out or reform of harmful incentives consistent and in harmony with the Convention and other relevant international obligations, as well as the integration of biodiversity in national accounting and, as appropriate, reporting systems;

(g) *Traditional knowledge* - The need for better ways to draw on relevant indigenous and traditional knowledge systems and their collective actions of indigenous and local communities to complement scientific knowledge in support of the implementation of the Strategic Plan for Biodiversity 2011-2020 taking into account the need for prior informed consent;

(h) *Scientific and technical cooperation* - The need to foster improved scientific and technical cooperation among Parties as well as scientific networks, relevant organizations to match capabilities, avoid duplication and achieve efficiencies. The need to enhance the clearing-house mechanism to make it more effective.

4. *Takes note* of the further views of Parties with regard to cross-cutting issues in annex I and specific Aichi Targets of the Strategic Plan for Biodiversity 2011-2020, as provided in annex II;

5. *Recommends* that the Conference of the Parties, at its twelfth meeting, takes note of key scientific and technical needs relating to the implementation of the Strategic Plan for Biodiversity 2011-2020, as identified in this document, and use the key findings in future considerations on the implementation of the Strategic Plan and achievement of the Aichi Biodiversity Targets;

6. *Notes* that the Aichi Biodiversity Targets provide readily available elements for biodiversity-related goals, targets and indicators that could be integrated into the set of sustainable development goals;

7. *Highlighting* the urgency of implementing measures, including those noted in paragraph 11 of decision XI/18, to achieve Target 10, *agrees* to consider this matter as part its work at its eighteenth meeting to update the specific work plan on coral bleaching, in line with paragraph 18 of decision XI/18;

8. *Invites* the Group on Earth Observations Biodiversity Observation Network (GEO BON) to engage with Parties on selected and clearly defined priority needs related to building observing systems and biodiversity monitoring;

9. *Invites* the Biodiversity Indicators Partnership to continue its efforts on capacity-building, information sharing and to continue working to harmonize and/or link national and regional indicators with global datasets;

10. *Requests* the Executive Secretary, subject to the availability of the necessary resources, to:

(a) Further enhance the clearing house mechanism of the Convention to enable the provision of targeted technical support to Parties on the identification and use of suitable policy support tools, as well as on enhanced synergies across national, regional and international institutions;

(b) Organize a meeting of the Ad Hoc Technical Expert Group on Indicators for the Strategic Plan for Biodiversity 2011-2020 to review the indicators proposed to be added to those listed in decision XI/3;

(c) Continue collaborating with the Biodiversity Indicators Partnership, the Group on Earth Observations Biodiversity Observation Network (GEO BON), the Food and Agriculture Organization of the United Nations (FAO), the International Union for Conservation of Nature (IUCN) and others to fill the gaps in coverage of indicators for all 20 Aichi Biodiversity Targets;

(d) Recalling paragraph 17 of decision XI/2, undertake, in collaboration with relevant centres of expertise and relevant organizations and networks, including the Global Biodiversity Information Facility (GBIF), GEO BON and the Biodiversity Indicators Partnership, regional capacity building activities and training related to mobilization, management and analysis of data, information and knowledge suitable for monitoring and managing biodiversity, including by strengthening national clearing-house mechanisms;

(e) Carry out an analysis of methodologies used in self-assessments of progress towards implementation of the Convention reported in fourth national reports and other reports;

(f) Prepare terms of reference for a possible voluntary mechanism to review implementation of the Strategic Plan for Biodiversity at national level with a view to providing targeted guidance to countries. These could draw upon the experience of the environmental performance reviews undertaken by the Organisation for Economic Co-operation and Development (OECD) and the United Nations Economic Commission for Europe (UN-ECE);

(g) Undertake pilot assessments of the effects of measures taken in specific thematic areas or case studies;

(h) Review national experience in the evaluation of effectiveness of policy following the completion of the mid-term review, and report to a meeting of the Subsidiary Body before the thirteenth meeting of the Conference of the Parties;

(i) Prepare a report on possible ways and means to address the challenges listed in paragraph 15 of Annex 1 of this recommendation and make it available for consideration by the Conference of the Parties at its twelfth meeting.

*Annex I***CROSS-CUTTING ISSUES*****Policy tools and guidance***

1. There is an abundance of policy support tools and methodologies available to Parties that enable action to implement the Strategic Plan for Biodiversity 2011-2020 and achieve the Aichi Biodiversity Targets. The lack of tools or guidance, for some Targets, or the difficulties of applying them in some countries, should not prevent most countries from taking effective action to implement the Strategic Plan. New tools should only be developed when there is a clearly demonstrated need. The focus should be on facilitating the use of existing tools by making them easily available, explain their conditions of use, and by adapting them to specific national circumstances, bearing in mind the sovereign right of countries to choose their own approaches, visions, models and tools in accordance with national circumstances and priorities.
2. A limited number of additional tools and methodologies are needed, which include:
 - (a) Guidance on the social, economic and cultural drivers motivating behavioural change, their interplay, and the implications for policy design;
 - (b) Tools and methods that, in conjunction, are able to recognize the full range of biodiversity values, including its social, spiritual, and cultural importance;
 - (c) Approaches to use non-economic incentives and implement associated measures, such as the incentive effects of societal institutions, including collective property institutions and associated governance arrangements, and the contribution of indigenous and local communities;
 - (d) Good practice guidance for identifying incentives that are harmful for biodiversity, and means to reform these, based on successful case studies and lessons learned;
 - (e) Tools and methodologies for achieving sustainable consumption;
 - (f) Integrated land-use planning to address multiple Aichi Biodiversity Targets within the broader landscape and seascape.
 - (g) Methodologies to improve the success of ecological restoration and the maintenance of ecosystem resilience
 - (h) Tools and methodologies to address genetic diversity of socio-economically and culturally important species that are not used for food and agriculture or forestry
 - (i) Guidance on best practices for appropriate access to and use of traditional knowledge, innovations and practices for conservation and sustainable customary use
 - (j) Guidance on the opportunities and limitations of transferring good practices across different biomes and sectors, for example from forestry to agriculture, or from terrestrial to marine systems
 - (k) Tools for assessing, communicating and managing potential trade-offs among poverty eradication, food security, and biodiversity conservation objectives
3. Technical and scientific cooperation among Parties should be promoted through the clearing-house mechanism. This could include: the sharing of experiences and good practices on the development and application of national tools; and the application of global tools for use at national level.
4. The clearing-house mechanism should enable Parties, especially developing countries, in particular the least developed countries and small island developing States among them, and countries with economies in transition, to express their specific technical and scientific needs. The clearing-house

mechanism should also enable Parties, as well as scientific networks, relevant organizations and funding bodies to indicate their areas of competence and expertise. The mechanism could thereby facilitate the matching of needs and capabilities.

Data, monitoring, observation systems and indicators

5. Citizen and community based initiatives have an important and growing role to play in helping deliver in situ monitoring whilst innovative application of remote sensing can compliment this with measurements at large scales. Standardization of protocols for both as well as platforms and mechanisms for their integration will help make individual efforts more effective and enable aggregation to support needs at larger scales

6. Indigenous and local knowledge systems are at the core of sustainable management of many ecosystems. Local knowledge and monitoring efforts are often a critical source of information, complementing scientific approaches and frequently covering different temporal and spatial scales. Respect, trust, equity and transparency are essential for enabling monitoring that draws on combinations of indigenous and scientific knowledge systems.

7. There is a need for long term data series to facilitate the monitoring of change in the status of biodiversity over time, and for the measuring of progress towards 2020 and beyond.

8. Better access to near-real time biodiversity monitoring data can promote greater public awareness on biodiversity, and enable the participation of a wider range of stakeholders in biodiversity policy and decision making.

9. There is a need to continue and enhance the dialogue between policymakers and the earth observation community with a view to enhancing the collection and access to data for monitoring progress in achieving the Aichi Biodiversity Targets and associated national targets and indicators.

10. Free and open access to satellite data has enabled greater use of remote sensing data for the monitoring of biodiversity. The salience of remote sensing data is much improved if it can be made available in near-real-time and processed into key products that are useful to decision makers and environmental protection agencies (e.g. land-use maps).

11. Establishing and sustaining biodiversity observing systems at national, regional and global levels require: data standards, interoperability and coordination amongst institutions as well as capacity-building and sustained funding, especially to developing countries, in particular the least developed countries and small island developing States among them, and countries with economies in transition

12. Regional collaborative programmes, or regional centres, could promote biodiversity observation networks and support data analysis for use by countries of the region.

10. Essential Biodiversity Variables developed by GEO BON and other comparable approaches or variables, once clearly defined and tested, have a potential to improve the efficiency of monitoring by focusing observations on a limited number of key attributes. Such information on the types of observations most useful to the biodiversity community will enable space agencies to deploy appropriate sensors for the relevant variables.

13. A toolkit (“BON-in-a-Box”) that can be tailored to national and regional needs would fill a major gap. Such a toolkit might include, among others a handbook, guidance on the design and implementation of biodiversity observatories, Essential Biodiversity Variables in support of indicators and data standards, strategies to integrate remotely-sensed and *in-situ* data, and guidance on terminology, methods and standards.

14. The Global Biodiversity Informatics Outlook (GBIO) represents a roadmap and a framework to enhance access to and sharing of historic and legacy data, as well as new observations and measurements from remote sensing, local monitoring activities and citizen science. It thereby allows for the analysis of data across different data sets. GBIO thus promotes a globally coordinated approach, to mobilize

biodiversity information and to enhance efforts to make data public and accessible for use in policy and research.

Challenges

15. Implementing the Strategic Plan for Biodiversity 2011-2020 presents significant challenges to all Parties, especially developing countries Parties, in particular the least developed countries and small island developing States among them, and Parties with economies in transition. Challenges relate to, *inter alia*:

- (a) Limited human and financial resources at the national and subnational levels to develop and implement the national biodiversity strategy and action plan;
- (b) The absence of baselines or of sufficient information on current trends to facilitate target setting;
- (c) Limited capacity to conduct meaningful consultations and stakeholder engagement;
- (d) Limited capacities to manage biodiversity effectively;
- (e) Limited availability of, or access to, context-specific guidance and tools, and limited capability to adapt global guidance and tools for application at national and subnational levels;
- (f) The inadequacy of monitoring systems to track progress;
- (g) Limited policy coherence and integration.

16. A multitude of efforts is being undertaken to overcome the challenges and limitations noted in sub-paragraph (s) above, both through innovative local solutions and by fostering partnership and collaboration among Parties and other partners.

Success Stories

17. There are many areas in which good progress has been made to support implementation of the Strategic Plan for Biodiversity 2011-2020 including *inter alia*:

- (a) Many Parties report that national biodiversity strategies and action plans are effective means to implement actions to achieve the targets and foster improved inter-sectoral coordination;
- (b) The identification of relevant national institutions, and assignments of targets (clusters of targets or Strategic Goals) to them, as "biodiversity champions", has helped enhance ownership, implementation and inter-agency cooperation; the establishment of national biodiversity institutions focused on facilitating the science-policy interface is recommended whenever possible and feasible by parties.
- (c) Regional initiatives, such as regional biodiversity corridors and transboundary protected areas have been instrumental in mobilizing collaborative actions for biodiversity conservation and enhancing regional cooperation;
- (d) Biodiversity guidelines developed in partnership with sectors, for example mining or energy, can be a particularly useful tool to reach consensus on objectives, create transparency and certainty for the business sector, and represent important decision support tools;
- (e) Improved attention to restoring ecosystem services in agricultural systems has delivered both increased agricultural productivity and benefits beyond farming communities, across a large number of countries and regions and under a wide variety of climatic zones and agro-economic settings, convincingly demonstrating that food security and environmental sustainability can be mutually supporting through the more effective management of biodiversity;
- (f) Significant advances have been made in monitoring ocean and coastal biodiversity such as early warning systems for algal blooms and coral bleaching as well as monitoring of mangrove ecosystems in certain regions;

(g) The development and implementation of policy mixes, entailing enhanced monitoring, surveillance and enforcement capacities combined with incentives, collaborative activities and enhanced stakeholder engagement has helped curb deforestation in some parts of the world;

(h) The dissemination of publicly available information has helped mobilize public opinion in support of measures responding to biodiversity loss;

(i) The combination of top-down policies at national level with community-driven bottom-up actions at local level has strengthened the sustainable management of biodiversity in many parts of the world.

Assessing effects of types of measures taken under the Convention

18. While policy evaluation is a commonly applied approach it is difficult to discriminate and measure the specific effects of policies, especially those which have multiple objectives and which are delivered in a complex policy landscape. The feasibility of such evaluations should be explored by undertaking pilot assessments of the effects of measures taken in specific thematic areas or case studies.

*Annex II***I. SUMMARY OF VIEWS ON STRATEGIC GOAL A***General conclusions on Goal A*

1. Implementation of Aichi Targets 1 to 4 is critical as it will provide a significant stimulus to the implementation of many other Aichi Targets and to resource mobilization.
2. It is essential for effective mainstreaming to achieve better policy coherence, that is, the development and application of common objectives across sectors, and the implementation of activities that are mutually supportive activities. Good governance arrangements are critical in achieving this.
3. Further research is needed on the social, economic, and cultural drivers motivating behavioural change, their interplay, and the implications for policy design.
4. It is important to reaffirm that the values of biodiversity include intrinsic value as well as ecological, genetic, social economic, scientific, educational, cultural, recreational and aesthetic values of biological diversity and its components.
5. It is critical to align policies, incentives and business within safe ecological limits.

Target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.

6. The programme of work on communication, education and public awareness (CEPA) provides the main framework for action towards this target. Toolkits and other support resources have been developed by the Secretariat as well as by other relevant global, regional and national actors. These resources are adequate but additional resources are needed for adaptation of these to local conditions and languages.
7. In order to overcome remaining gaps, create the additional tools and methodologies needed, and integrate these actions to promote behavioural change, there is a need to:
 - (a) Identify target groups and their needs and interests;
 - (b) Identify most effective communication means and technologies for these, including intercultural approaches to communication;
 - (c) Gather information on methodologies for motivating behaviour change, such as the report from the OECD report “Greening Household Behaviour: The Role of Public Policy”, and implement campaigns on the basis of this data;
 - (d) Work with local authorities, including cities, and indigenous and local communities, to develop and achieve domestic targets and to extend and adapt tools and campaigns; and
 - (e) Increase impact at the local level by using locally relevant approaches to apply global principles.
8. Recent good practice include integrating biodiversity into the curriculum of primary and secondary formal education, as well as developing informal education tools in collaboration with botanical gardens, natural history museums, zoos and aquariums.
9. Monitoring progress against this target, using a range of methodologies and indicators, is advancing, but challenges remain. Comprehensive data remains limited at the global level. The Biodiversity Barometer of the Union for Ethical Biotrade was recognized as an indicator of global significance. Progress could be further improved by agreeing on core concepts and common methodologies for use by Parties.
10. Given their particular role as traditional stewards of biodiversity, the role of indigenous and local communities needs to be reflected in public awareness indicators , such as for instance in the form of

measurement of the number of cooperative activities between Governments and indigenous and local communities.

Target 2: By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.

11. There are a variety of tools and methodologies available to help assess the values of biodiversity at different levels, including in the private sector. While many tools and methodologies focus on economic values, guidance has been developed in some countries on integrated assessments of values of biodiversity. While there are indications that such tools and methodologies are increasingly being applied, there is a need to further develop and apply tools and methods that, in conjunction, are able to recognize the full range of biodiversity values, including its social, spiritual, and cultural importance.

12. There is also a need to further develop, through inter-scientific dialogue and the use of different knowledge systems, tools that reflect and strengthen collective action of indigenous and local communities in biodiversity management and the conservation of the system of life, in order to achieve well-being in harmony and balance with Mother Earth. Reflecting the values of biodiversity in development and poverty reduction strategies and national accounting systems can rely on a broad range of policies, tools and methodologies, in accordance with national circumstances and priorities. This can be a technically challenging task and there are major obstacles to the implementation of the policies, tools and methodologies associated with this target.

13. The work of several international partner organizations and initiatives, such as the United Nations Committee of Experts on Environmental-Economic Accounting, the Economics of Ecosystems and Biodiversity (TEEB), and the global partnership on Wealth Accounting and the Valuation of Ecosystem Services (WAVES), is critical for advancing implementation of some aspects of this Target. Guidance and tools have been developed by these organizations and initiatives and several pilot initiatives are already ongoing to further adjust and test them.

14. Applying these tools and methodologies requires significant expertise and capacity, as well as data, and collaboration with local and subnational governments. This is further compounded by the complexity of establishing national development strategies, poverty reduction plans, national accounting and reporting processes. The continuation and expansion of capacity-building will be important to speed up the use of such tools and methodologies and implement Aichi Target 2.

Target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socioeconomic conditions.

15. It is important to follow a two-pronged approach that would consist of both promoting positive incentive measures, bearing in mind potential budgetary implications, while simultaneously eliminating, phasing out or reforming harmful incentives, as a critical and necessary step that would also generate net socioeconomic benefits.

16. Several relevant policy tools and associated guidance material have been developed under the Convention, while international organizations and initiatives have also prepared analysis and guidance on incentive measures. Considering that incentives, including subsidies, have case-specific contexts, some countries have further developed step-by-step guidance tools and analyses at national level, such as on existing incentives, including subsidies, in order to identify priority candidates for elimination, phase-out, or reform.

17. Tools and methodologies could be further developed to address non-economic incentives and implement associated measures, such as the incentive impacts of institutions, including collective property and associated governance arrangements, the capacity to enforce regulation, and the availability of information.

18. Good practice guidance could be developed in identifying incentives that are harmful for biodiversity and means to address these, based on successful case studies and lessons learned.

19. There is significant information on subsidies and incentives more generally, available at least for some sectors at the global level; however, indicators need to be further developed to be ready for use at global level.

20. Additional assessments may be needed in order to ensure that incentive measures are implemented in harmony with other relevant international obligations.

Target 4: By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

21. Existing policy support tools and methodologies are of a general nature and need to be adapted to different governance levels (regional/national/subnational/local) and for economic sectors. In particular, in order to effectively engage businesses, there is a need for information and policy support tools as well as practical management tools for assessing corporate dependency and impact on biodiversity and ecosystem services, and to integrate biodiversity into corporate decision-making and reporting. . Such tools could be disseminated for instance through the Business and Biodiversity Platforms. There is also a need to reflect on potential incentives for businesses to support sustainable consumption that reflects biodiversity considerations.

22. The United Nations 10-Year Framework Programmes on Sustainable Consumption and Production provides the general structure for taking action and existing processes there under could be harnessed.

23. Changing production and consumption models implicates awareness of biodiversity and behaviour change – there is a need for integrated systems, including back-casting approaches, the application of social sciences, non-market tools, and collective action.

24. While tools and methodologies seem to be available for cleaner production, recent progress includes tools and methodologies on achieving sustainable consumption, such as footprint measurement approaches that evaluate the impact of consumption at national, subnational/local, or household levels.⁹

25. Exchange information, including good practices and lessons learned, could provide further guidance, such as on national targets aligned with Aichi Biodiversity Target 4.

26. The leadership and contribution of Ministries of Economy and Finance is perceived as key to mobilize the various industry sectors and mainstream implementation.

II. SUMMARY OF VIEWS ON STRATEGIC GOAL B

General conclusions for Goal B

27. Overall policies and guidance are well developed for Strategic Goal B. Implementation of existing policies and guidance remains the major challenge. There is also a need to develop tools to assess the impact of these policies and guidance.

28. Many tools and much experience on Goal B is now available. Therefore, there is an opportunity for focussed research on the effectiveness of tools and guidance for addressing habitat loss, whilst balancing multiple demands on habitats, and of approaches for sustainable agriculture, forestry and

aquaculture, including the role of certification schemes, as well as how effectiveness of tools and guidance varies with the scale of their deployment (local, national, regional and global).

29. Particularly with regards to targets 5 and 7, there is a need to strengthen policies, tools and guidance with regards to land use planning that can also take into account other relevant Aichi Biodiversity Targets (such as targets 11, 14 and 15), including landscape scale approaches to biodiversity management such as Satoyama and related initiatives.

Target 5: By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

30. Policies, tools and guidance are relatively well developed, although there is a need to develop remote sensing tools that can be applied at fine scales to measure habitat change. New tools may be needed for decisions makers to account for the costs related to habitat loss and degradation.

31. In terms of monitoring, data are needed to enable the assessment of the short- and long-term impacts of land use change in order to help address the drivers leading to the loss of habitat. Challenges include monitoring sectoral pressures associated with habitat loss, especially the implications of land use change on critical ecosystems such as wetlands and fresh water.

32. Further guidance is required for classifying and mapping natural habitats and the establishment of baselines to measure progress. Lack of definitions for terms such as “degraded”, “natural habitats” and “fragmentation” remains a constraint including. Some Parties recognise fragmentation as a form of degradation although this understanding is not universally agreed.

33. The proposed FAO Voluntary Guidelines for Forest Monitoring and the FAO Voluntary Guidelines on Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security are relevant to activities aimed at achieving a range of Aichi Biodiversity Targets, in particular Target 5, as well as Targets 7, 11 and 15.

Target 6: By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

34. At the global, regional, and often national levels, policies, tools and guidance are relatively well developed with regards to fish stocks and the impacts of fishing. Monitoring of fish catches is relatively well developed, although not without gaps and constraints. At the global level this topic is already covered by the FAO including attempts to improve monitoring and data.

35. Major challenges remain in monitoring the impacts of fishing on ecosystems and biodiversity (other than the fish catch itself) and the application of the term “safe ecological limits” at the population and ecosystem levels. As an interim measure, indicators and monitoring should focus on inland, coastal and pelagic fisheries to address gaps on harvesting and other aspects of fisheries management.

36. A combination of good governance, surveillance approaches, accountability among stakeholders and law enforcement were also noted as important factors for the conservation and management of fishery resources.

Target 7: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

37. For agriculture, besides the programme of work on agricultural biodiversity, and for aquaculture, there is limited guidance specifically provided under the Convention on Biological Diversity but considerable guidance available at the global, regional and national levels through partners including in

particular the FAO, the CGIAR centres and many intergovernmental and non-governmental organizations, and farmers' and producers' organizations.

38. Measures to foster policy coherence among different sectors, including agriculture, aquaculture and forestry were underscored. In many countries inter-ministerial dialogues and networks have been created to enhance greater coordination and cross-sectoral cooperation. These measures have proved useful, for example, in balancing agricultural intensification and in promoting small scale ecosystem-related production systems.

39. The current guidance does not adequately address the important positive or negative influence of indirect drivers, such as incentives, trade and consumption patterns, on biodiversity.

40. Challenges that remain include finding the appropriate balance between intensive (high input) and smaller scale production systems, as well as sustaining the health of soil.

41. While there are no universally agreed criteria for sustainability for forests, agriculture, and aquaculture there are internationally agreed elements of sustainability, such as for forests, that should be considered. Sustainability criteria should be comparable, and support desired biodiversity outcomes.

42. The monitoring framework can use a small number of globally consistent indicators that work across ecosystems to provide an overview; as well as flexible, ecosystem specific indicators that reflect local circumstances that are consistent with national priorities and conditions. However, there is a need to ensure that indicators reflect the area sustainably managed and not just the area certified.

43. Global and regional level criteria and indicator processes have made some advances in the collection of data that are consistent among processes and reduce the burden of reporting on countries to report on areas that are sustainably managed.

Target 8: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

44. There is much policy guidance and tools available at global, regional and national levels, although with significant gaps in implementation of measures to significantly reduce pollution.

45. The Strategic Approach to International Chemicals Management (SAICM) is a policy framework to guide efforts on the sound management of chemicals globally.

46. A major gap is with regards to soils as sinks for pollutants and as a substrate for biodiversity.

Target 9: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

47. National invasive species strategies and action plans are developed and integrated in NBSAPs in a number of countries.

48. International standards for sanitary and phytosanitary measures were developed within the context of other international agreements and not fully focused on biodiversity. Therefore it is not simple for Parties to apply the measures under environment-related policies. Explanatory materials (COP XI/28) would assist Parties to apply these international standards and guidance to achieve Target 9 (measures to be in place) if such materials are associated with capacity development opportunities.

49. Information on invasive alien species is needed and the Global Invasive Alien Species Information Partnership is filling gaps in this regard. Further information on pathways and measures to control them would be useful.

50. Tools for cost benefit analysis of the relative feasibility of eradication *versus* management for established invasive alien species can facilitate decision making, therefore tools for prioritizing pathways for invasions and tools for identifying species of high impact (consistent with decision XI/28, paragraph 26 (b)) should be developed as a priority.

Target 10: By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

51. Given the 2015 deadline for this target and the threats faced by coral reefs in particular, urgent measures are needed to achieve this target.
52. A major gap is the identification of vulnerable ecosystems at the national and regional levels using consistent assessments of relative vulnerability to climate change, other pressures and the effects of multiple pressures.
53. At the global/regional levels, these assessments should explore which regions are most vulnerable and assess the reasons for differences between them.

III. SUMMARY OF VIEWS ON STRATEGIC GOAL C

General views on Goal C

54. There are many useful and technically sound tools for achieving the targets under Strategic Goal C and the main focus should be on using and implementing the already available tools rather than developing new ones;
55. Limitations for using existing tools and methodologies in some cases are their level of generality and there is a need for adjusting them to national circumstances, priorities and capacities;
56. Recent innovative approaches to support and enhance data recording, capture and flow - such as developments in sampling (e.g. through Earth Observation or DNA/eDNA survey), and developments in data capture techniques (for example, recording species observations online and through 'apps' for mobile phones) are valuable tools with scope for much wider application and merit further consideration and development.

Target 11: By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.

57. The programme of work on protected areas provides guidance on elements of Target 11 and many organizations have contributed to the significant number of tools covering most aspects of Target 11 as well as providing support to the implementation of activities aimed to achieve the target at national, regional and global levels.
58. The organization of a series of regional workshops on ecologically or biologically significant marine areas (EBSAs) has fostered valuable scientific collaboration and contributed to capacity building at the regional scale.
59. Marine spatial planning at a broader regional scale, building upon scientific understanding of ecological or biological values and threats can contribute to a coordinated use of various conservation and management tools, such as Marine Protected Areas, fisheries management measures, and other policy and management interventions toward implementing the Strategic Plan.
60. Further efforts in the following areas inter alia would be useful:
- (a) Targeted research on the impacts of climate change on the functioning of protected area networks, and on the effectiveness of management actions in protected areas affected by climate change, particularly with regard to waterways, wetland ecosystems, mountain ecosystems and the species of northern habitats could facilitate the development of robust protected area networks;

- (b) Research on species-specific conservation and monitoring programmes, and management of habitats to enable effective management and monitoring of protected areas;
- (c) Adapting global marine spatial planning tools and other relevant tools into national and regional contexts, including their application, as well as monitoring habitat loss;
- (d) Further developing effective landscape/seascape-scale approaches to managing multiple drivers of ecosystem loss and degradation including integration of effective actions to support ecosystem restoration;
- (e) Developing financial sustainability plans for protected areas.
- (f) Use of existing information on areas of particular importance for biodiversity (such as key biodiversity areas) to improve coverage of protected areas.
- (g) Further consideration of what constitutes other effective area based conservation measures for the purpose of reporting progress toward this target
- (h) Develop indicators to assess the effectiveness and representativeness of protected areas

Target 12: By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

61. The IUCN Red List of Threatened Species, and assessment of threatened species at the national level, can be used to trigger conservation action, particularly where they are aligned with existing initiatives on species conservation including those under CITES. National Red Lists, or comparable assessments, can also assist with land use planning and responsible impact assessments.
62. Scientific and technical needs related to achieving Target 12 include a better understanding of the drivers of the decline of species, the impacts of invasive alien species, the long-term implications of climate change and the role of multi-species and ecosystem approaches in recovery planning.
63. Additional efforts should be made in a number of areas including *inter alia*:
- (a) Devising measures for addressing control or eradication of invasive alien species including action for threatened species and their recovery;
 - (b) Conducting IUCN Red List assessments, or comparable assessments, for species of plants, fungi, invertebrates and marine and freshwater realms;
 - (c) Enhancing the capacity to interpret the IUCN Red List for setting and achieving targets;
 - (d) Improving regional cooperation to conserve migratory and transboundary species;
 - (e) Designing cost effective conservation methods.

Target 13: By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

64. The programme of work on agricultural biodiversity and Target 9 of the Global Strategy for Plant Conservation are important frameworks for the development of policies for achieving Target 13.
65. The Global Plans of Action for Plant, Animal and Forest Genetic Resources, developed and adopted by FAO Commission on Genetic Resources for Food and Agriculture¹, and the preparation of the State of the World Report on Biodiversity for Food and Agriculture, are particularly relevant frameworks to support Target 13.

¹ <http://www.fao.org/nr/cgrfa/cgrfa-global/cgrfa-globplan/en/>

66. The FAO Commission on Genetic Resources for Food and Agriculture has developed guidance and tools which support achieving Target 13 and is developing a small number of higher order indicators relevant to this target.
67. Most of the monitoring, data, tools, policies and guidance for Target 13 are within the realm of genetic resources for food and agriculture, including forest genetic resources. Progress towards this target is highly dependent upon partners in the food and agriculture field.
68. Additional efforts should be made in a number of areas including *inter alia*:
- (a) Maintaining and safeguarding genetic diversity *in situ* including, where appropriate, through biocultural approaches that promote conservation and restoration while valuing cultural and traditional knowledge.
 - (b) Arriving at optimal balance between *in situ* and *ex situ* methods of conservation and their complementarity
 - (c) Enhance cooperation among Parties that use management mechanisms with biocultural approaches
 - (d) Further development, in some countries, of approaches to reduce market or commercial pressures that simplify crop and livestock systems;
 - (e) Scaling-up of the use of gene banks;
 - (f) Enhancing cooperation between organizations working in the agriculture and environment sectors;
 - (g) Further actions to address genetic diversity of socio-economically genetic resources not used for food, agriculture and forestry.

IV. CONCLUSIONS ON STRATEGIC GOAL D

General conclusions on Goal D

69. The information documents presented to the eleventh meeting of the Conference of the Parties on ecosystem restoration provide a wide range of guidelines, tools and technologies for addressing the targets under Strategic Goal D; therefore the few gaps identified should not constrain the implementation of this goal.
70. The work being undertaken by Executive Secretary in pursuance of request contained in Decision XI/16 should also provide additional tools and guidance relevant to Targets 14 and 15.
- Target 14: By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.***
71. The cultural, spiritual and traditional linkages with ecosystem services should be recognized and integrated in national, regional and global policy frameworks. In that context the Satoyama Initiative may be a useful tool to facilitate such recognition.
72. One of the important benefits of ecosystem services is in building resilience to the impacts of climate change and natural disasters.
73. There is a need to promote the application and use of ecosystem-based management and ecosystem-based adaptation.
74. Additional efforts should be made in a number of areas including, *inter alia*:

(a) Developing policy support and implementation tools and methodologies aimed at restoring and safeguarding vulnerable mountain ecosystems in order to maintain fragile ecological balance and ameliorate livelihoods of mountain dwelling communities;

(b) Enhancing understanding of the contribution of ecosystem restoration to improved human well-being, including related socio-economic benefits, and developing further guidance for categorizing, and assessing ecosystems providing essential services that contribute to human well-being;

(c) Developing methods to prioritize areas and reduce costs of ecosystem restoration.

Target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.

75. Restoration is often ecosystem and situation-specific and guidance needs to be adapted to local situations. Restoration projects should be conducted using adaptive management, i.e. with pre-defined targets and indicators, multiple trials to determine the best method of treatment, monitoring of results, and reporting.

76. Guidance is available to identify ecosystems that are vulnerable and which also maintain large carbon stocks.²

77. Guidance is available on ways to better map degraded ecosystems.³

78. There is limited capacity and knowledge on the restoration of coastal and marine ecosystems.

79. There is a need for efficient and effective dissemination of best practices and further development of pilot projects for achieving this target.

80. The importance of soil conservation for the achievement of Aichi Target 15 should be emphasized, particularly in those ecosystems that are rich in carbon stocks and organic soils

81. Additional efforts should be made in a number of areas including, *inter alia*:

(a) Developing of an indicator to determine achievement of the 15% target, and additional indicators to measure ecosystem resilience, the rate and extent of habitat degradation, as well as efforts to combat desertification;

² Such information is available on global above-ground biomass (AGB) carbon mapping, for instance on the WCMC REDD+ website. A 2008 Global Environment Centre publication on wetlands, “*Assessment on peatlands, biodiversity and climate change*” highlights the importance of peatlands in carbon storage and provides maps of deposits by depth.

³ For example recent publications on ways of assessing forest degradation: *Ecology and Society* 2013, Volume 18, Number 2, article 20; and *FAO FRA Working Paper 177*. Both of these are part of the CPF-led effort to define forest degradation and provide information on measurement.

- (b) Improving tools for remotely measuring carbon in terrestrial and aquatic ecosystems;
- (c) Enhancing understanding of the application of the concept of ecosystem resilience, in monitoring and managing ecosystems at different levels in order to secure the provision of multiple ecosystem services, and the ability of ecosystems to adapt to a changed climate and to continue to sequester carbon over time;
- (d) Further developing tools for systematically assessing and prioritizing potential areas for ecosystem restoration, taking into account the location and extent of degraded lands in relation to conservation areas and other high nature value areas, for improving habitat connectivity;
- (e) Improving tools are needed for measuring carbon storage and fluxes and understanding the interplay with biodiversity conservation, including in non-forest ecosystems and at local scales;
- (f) Strengthening scientific efforts to further support the development of nature-based solutions for ecosystem restoration and resilience through sustainable innovation;
- (g) Developing tools for assessing the effectiveness of restoration efforts.
