



**CBD**



**Convention on  
Biological Diversity**

Distr.  
GENERAL

UNEP/CBD/GTI-CM/11/2  
27 May 2011

ORIGINAL: ENGLISH

**THE COORDINATION MECHANISM FOR THE  
GLOBAL TAXONOMY INITIATIVE**

Eleventh meeting

Montreal, 3-4 June 2011

Item 3.3 of the provisional agenda

**REVIEW OF THE DRAFT STRATEGY FOR TAXONOMIC CAPACITY-BUILDING 2011-2020**

*Note by the Executive Secretary*

1. The Conference of the Parties at its tenth meeting requested the Executive Secretary, in consultation with the Coordination Mechanism for the Global Taxonomy Initiative, national focal points for the Initiative and relevant institutions, bodies and organizations, to develop a comprehensive capacity-building strategy for the Global Taxonomy Initiative at global and regional levels that addresses the Strategic Plan for Biodiversity 2011-2020 (decision X/39, paragraph 16).
2. Accordingly, the Executive Secretary prepared a “draft capacity-building strategy for the Global Taxonomy Initiative”, herewith for consultation with the Coordination Mechanism for the Global Taxonomy Initiative.
3. The contents of the present document provide the elements of the document for the fifteenth meeting of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) to be held in Montreal from 7 to 11 November 2011.

In order to minimize the environmental impacts of the Secretariat's processes, and to contribute to the Secretary-General's initiative for a C-Neutral UN, this document is printed in limited numbers. Delegates are kindly requested to bring their copies to meetings and not to request additional copies.

## **CAPACITY-BUILDING STRATEGY FOR THE GLOBAL TAXONOMY INITIATIVE**

### **EXECUTIVE SUMMARY**

More than ever, we need a comprehensive taxonomy of biodiversity if we wish to implement the Convention and the implementation of the Strategic Plan for Biodiversity 2011-2020. Noting that taxonomic information underpins the capacity to identify, monitor, and predict the future status of biodiversity, the Secretariat further rationalized the planned activities in the programme of work for the Global Taxonomy Initiative (GTI) based on the needs to draft a strategy in line with the Strategic Plan (X/2) and its implementation (decision X/5), including the implementation of Aichi Biodiversity Targets (X/7).

On the basis of taxonomic needs reported to the Secretariat and extracted from a survey of the fourth National Reports a draft capacity-building strategy for the GTI with a global vision, mission and actions as taxonomic imperative has been prepared by the Executive Secretary.

### **SUGGESTED RECOMMENDATION/CONCLUSION**

The Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) may wish to recommend that the Conference of the Parties:

(a) *Decides* the Capacity-Building Strategy for the Global Taxonomy Initiative annexed to the present document together with the standard format for taxonomic needs assessment;

(b) *Urges* Parties and other Governments to identify and prioritize the actions proposed as taxonomic imperatives and to include these actions in National Biodiversity Strategies and Action Plans (NBSAPs), taking into account that GTI capacity-building requires international collaboration and multi-disciplinary participation to ensure that taxonomic information provides Parties with scientific bases to identify and monitor the status of biodiversity;

(c) *Invites* relevant organizations, networks and scientific communities that are contributing information on biodiversity to participate in the actions outlined as taxonomic imperatives in National Biodiversity Strategies and Action Plans, so as to maximize the utilization of the Outcome-Oriented Deliverables for the Global Taxonomy Initiative annexed to decision X/22 and other relevant scientific information on biodiversity useful to the implementation of the Strategic Plan for Biodiversity 2011-2020;

(d) *Endorses* the terms of reference for the Coordination Mechanism for the Global Taxonomy Initiative to assist the Executive Secretary to facilitate the actions of taxonomic imperative, globally, and to enhance cross-sectoral communication and inter-disciplinary participation for actions at national and regional levels.

(e) *Requests* the Executive Secretary in collaboration with relevant international organizations, to prepare a training manual and modules, subject to the availability of financial resources. These can be used to contribute to capacity-building needs by assisting Parties to plan and implement actions recognized as taxonomic imperatives in a timely manner.

(f) *Requests* the Executive Secretary to organize training workshops with relevant international organizations, subject to the availability of financial resources, so the CBD and GTI National Focal Points may disseminate biodiversity information to assist Parties to report on the status and value of biodiversity in the 5<sup>th</sup> and 6<sup>th</sup> National Reports.

(g) *Requests* the Executive Secretary to work with relevant organizations and initiatives, such as the World Conservation Monitoring Centre of the United Nations Environment Programme (UNEP-WCMC), BioNET INTERNATIONAL, the Global Biodiversity Information Facility (GBIF), International Barcode of Life (iBOL), IUCN, and other inter-disciplinary scientific programmes, to keep track of progress made in actions designated as taxonomic imperatives at international level, and to report the progress to the Working Group of Review and Implementation.

## I INTRODUCTION

1. In decision X/2 the Conference of the Parties adopted the Strategic Plan for Biodiversity 2011-2020 with its Aichi Targets.

2. Recalling that the GTI is a cross-cutting issue which must seek to implement the three objectives of the Convention, the Conference of the Parties requested in paragraph 16 of decision X/39 that the Executive Secretary, in consultation with Coordination Mechanism for the Global Taxonomy Initiative, national focal points for the Initiative and relevant institutions, bodies and organizations, develop a comprehensive capacity-building strategy for the Global Taxonomy Initiative at global and regional levels that addresses the Strategic Plan for Biodiversity 2011-2020, taking into account:

(a) The need for consistency between the planned activities relevant to capacity-building in the programme of work for the Global Taxonomy Initiative and the outcome-oriented deliverables contained in decision IX/22;

(b) Taxonomic needs and capacities as already reported;

(c) The relevant stakeholders and resources required, as well as possible funding mechanisms; and

(d) Taxonomic needs and priorities for the thematic areas and other cross-cutting issues of the Convention, in particular for work on protected areas and invasive alien species.

3. To address the Strategic Plan for Biodiversity 2011-2020 and meet the Aichi Biodiversity Targets, national taxonomic needs and capacity requirements were derived from the fourth National Reports as shown in section II. Based on that information, the rationale for developing a capacity-building strategy for the Global Taxonomy Initiative at the global and regional levels is described in section III. A draft capacity building strategy for the GTI is annexed to this document.

## II HOW TAXONOMY UNDERPINS THE IMPLEMENTATION OF THE STRATEGIC PLAN FOR BIODIVERSITY 2011-2020

4. Biodiversity is a complex function of the gene pool, species interactions in various habitats, and ecosystems. To facilitate the process of mainstreaming biodiversity concerns, the components of biodiversity and its complex relationships need to be clearly understood by decision-makers. Scientific research on biodiversity *per se*, as well as the subsequent management and application of such data requires effective taxonomic data which makes it possible to plan measures that address the underlying causes of biodiversity loss and monitor the effectiveness of mitigation measures. Taxonomy is also required to sort out the information from assessments. The following section summarizes taxonomic needs to meet the Aichi Biodiversity targets (decision X/2) to rationalize the capacity- building, and make reference to the planned activities in the existing programme of work for the GTI (decision V/8 and decision VIII/3).

**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.

**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.

**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 are significantly reduced.

5. **Needs identified:** Valuation and estimation of biodiversity loss are based on the identification of what biodiversity is present in the local community, country, region or global spheres. Taxonomic information is required to record and retrieve the value of biodiversity from various information sources, most importantly, from inventories of species biodiversity. It is crucial that a global checklist of biodiversity is maintained, updated and annotated with national or regional taxonomic views (paragraph 7 decision VIII/3, planned activity 7 of the programme of work for the GTI).

**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 socio-economic conditions.

6. **Needs identified:** Discovery of life forms inspire the public imagination and create incentives for conservation and sustainable use of biodiversity. Taxonomic information teaches about the uniqueness of life forms and with the discovery of new species from local to extreme environments, such as thermal vents in deep seas or in the polar regions generates significant incentives in society toward conservation efforts.

**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.

7. **Needs identified:** Studies on ecology and economics to ensure knowledge on the reproduction, rehabilitation and restoration of biodiversity are built on wide range of natural sciences. From basic biology to applied sciences, including bioengineering utilizing genetic resources, taxonomic information is required in order to retrieve and sort out scientific information on the natural resources targeted, and in order to estimate and further evaluate the sustainable level of production and consumption.

**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. AND

**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. AND

**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.

8. **Needs identified:** An **ecosystem**-based approach and recovery plans and measures require information on the conservation status of the ecosystems targeted. In Australia an effort is made to

identify groups of threatened species based on similar distribution, association with particular ecosystems, similar threats or taxonomic affinity where efficiency of rehabilitation scales might be achieved in planning recovery actions<sup>1</sup>. The introduction of species carries risks of species invasion harmful to the native environment. Taxonomic information is necessary to assess and select species appropriate for introduction and to enable early detection of species invasion when species are entered. In 2008, the IUCN published the Red List of threatened species<sup>2</sup> with large numbers of contributors from the sciences. The IUCN acknowledged that without taxonomic and nomenclatural updates it would be much more difficult to implement the assessment and keep up-to-date with taxonomic changes.<sup>3</sup> The conservation community requires the sharing of up-to-date taxonomic data to accurately analyse the status of species conservation, restoration, mitigation and adaptation to climate change, and combating deforestation.

**Target 7:** By no later than 2020 areas under agriculture, aquaculture and forestry will be managed sustainably, ensuring the conservation of biodiversity.

9. **Needs identified:** Agriculture, aquaculture and forestry can all benefit from the deliberate introduction of species that are useful for production. The FAO Statistics and Information Service (FIPS) collates world capture and aquaculture production statistics at the species, genus, family or higher taxonomic levels in 2010 statistical categories (2009 data) referred to as species items.<sup>4</sup> Such databases need to be maintained and regularly updated.

**Target 8:** By no later than 2020, pollution, including pollution from excess nutrients, will be brought to levels that are not detrimental to ecosystem function and biodiversity.

10. **Needs identified:** Physical and chemical testing is not always sufficient, biological indicators are necessary to monitor the health of an environment or ecosystem, and can inform us on the longevity and cumulative effects of different pollutants on the ecosystem.<sup>5</sup> Skills to identify the indicator species are widely needed in conservation management<sup>6,7</sup>.

**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.

11. **Needs identified:** The identification of invasive alien species is a fundamental prerequisite for prevention, early detection, rapid response, control and eradication. The taxonomic needs assessment conducted in the United Kingdom<sup>8</sup> concluded that three broad classes of needs exist: (i) taxonomic outputs and services needed by non-taxonomists for the management of invasive alien species; (ii) taxonomic capacity and prioritization required within institutions in order to deliver key outputs and services; (iii) activities and prioritization of needs at a level above individual institutions to enable those institutions to implement the changes required at the type (ii) level, and meet the needs of non-taxonomists.

**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 proper functioning.

12. **Needs identified:** The Global Coral Reef Monitoring Network, as an operational network of the International Coral Reef Initiative, published the 5<sup>th</sup> global report on the "Status of Coral Reefs of the

<sup>1</sup> [http://www.anra.gov.au/topics/vegetation/pubs/biodiversity/bio\\_assess\\_conservation.html](http://www.anra.gov.au/topics/vegetation/pubs/biodiversity/bio_assess_conservation.html)

<sup>2</sup> <http://www.iucnredlist.org/initiatives/amphibians/analysis>

<sup>3</sup> <http://www.iucnredlist.org/initiatives/amphibians/acknowledgements/conservation-partners>

<sup>4</sup> <http://www.fao.org/fishery/collection/asfis/en>

<sup>5</sup> Karr, James R. (1981). "Assessment of biotic integrity using fish communities". Fisheries 6: 21–27

<sup>6</sup> Biodiversity and Conservation (2006) 15:4507–452

<sup>7</sup> <http://www.taxonomytraining.eu/content/taxonomy-freshwater-macroinvertebrate-bioindicator-species>

<sup>8</sup> [http://www.bionet-intl.org/opencms/opencms/tnaPages/project\\_tna\\_ias.html](http://www.bionet-intl.org/opencms/opencms/tnaPages/project_tna_ias.html)

World” in 2008. In this report, the difficulty of assessment due to “a range of methods, varying from very detailed species-level monitoring to rapid monitoring by trained volunteer, and the monitoring data are inadequate for a quantitative assessment.”<sup>9</sup> Further coordination of monitoring activities and training of species identification is required.

**Target 11:** By 2020, at least 17 per cent of terrestrial and inland water areas, 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.

13. **Needs identified:** Monitoring is vital for the identification and management of areas of particular importance for biodiversity and ecosystem services. In Malaysia (Borneo), as part of the IUCN Global Mammal Assessment, the Southeast Asian Mammal Databank team worked with a network of institutions and taxonomic experts to compile and disseminate all information on the distribution, basic ecology and conservation status of Southeast Asian mammals.<sup>10</sup> This report stressed that the efficiency of such studies depends critically on the quality of the inventory data available. The database produced by taxonomic experts in the network is indispensable in the effort to identify priority areas for conservation.

**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.

14. **Needs identified:** *In-situ* and *ex-situ* conservation of species and genes requires taxonomic accreditation. The International Treaty on Plant Genetic Resources for Food and Agriculture intends to share the benefits of using plant genetic resources through information-exchange, access to and the transfer of technology, and capacity-building, in which taxonomy provides information on the wild relatives and useful characteristics of the species.

**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.

15. **Needs identified:** A number of bioindicators, biotic indices and scores have been developed based on benthic macroinvertebrates, diatoms, fishes, aquatic and riparian vegetation to assess the water quality. The development of bioindicators in response to climate change, agricultural water waste and other pollution, and training in water management are all important roles of taxonomic research institutes. Importantly, indicators do not only apply to aquatic species. A shift in elevation of plant species for example<sup>11</sup> can also be an indicator of water cycle change, and taxonomic research assists with the early detection of such change.

**Target 16:** By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

16. **Needs identified:** The research activities undertaken by *ex-situ* conservation facilities and natural history collections can contribute to technology transfer (Article 15-19) and provide countries with genetic resources which may include non-monetary benefits (Annex to decision X/1 and Planned Activity 14 of the GTI Programme of work). Specimens and associated taxonomic information provides insight on

<sup>9</sup> [http://www.reefbase.org/resource\\_center/publication/main.aspx?refid=27173&referrer=GCRMN](http://www.reefbase.org/resource_center/publication/main.aspx?refid=27173&referrer=GCRMN)

<sup>10</sup> Struebig MJ et al. *Biodivers Conserv* (2010) 19:449–469.

<sup>11</sup> Crimmins SM et al. *Science* 2011: Vol. 331 no. 6015 pp. 324-327

the distribution of genetic resources. The information systems associated with the Nagoya Protocol Clearing-House Mechanism may refer to the above information, if necessary and appropriate, to search for the countries of origin of given species.

**Target 17:** By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.

17. **Needs identified:** The cross-cutting nature of GTI targets and taxonomic information necessary to achieving the Aichi Biodiversity Targets should encourage Parties to develop, adopt and commence implementing an effective, participatory and updated national biodiversity strategies and action plans.

**Target 18:** By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.

18. **Needs identified:** To ensure that the GTI taxonomic research contributes to our understanding of ethnobiodiversity for the conservation and sustainable use of biodiversity (planned activity 16 of Programme of Work) ethnobiodiversity studies has to be promoted.

**Target 19:** By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.

19. **Needs identified:** The monitoring of biodiversity status and trends is highly dependent on the taxonomic capacity to identify, record and analyse the biodiversity data provided. Taxonomic information on specimens and observations provided by experts is already accessible (outcome-oriented deliverables **annexed** to X/22), and further coordination of research activities will improve the quality and quantity of data contributing to this target. Taxonomic and nomenclatural updates contribute to a wide range of sciences and information on biodiversity including those related to values, functioning, trends, and the consequence of loss. In addition, mainstreaming biodiversity facilitates improving and sharing taxonomic knowledge with a broader range of sectors, including the environment, education, food and agriculture, forestry, fishery, and industry sectors as well as international trade and tourism.

**Target 20:** By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.

20. **Needs identified:** In light of the cross-cutting nature of the GTI, taxonomic capacity-building contributes to achieving Aichi Biodiversity targets. The identification of taxonomic needs should be included in the process of reviewing and updating national biodiversity strategies and action plans. Capacity-building activities for the GTI for sound observation of biodiversity, especially for the species, habitat and ecosystems that are prioritised, should appropriately funded with all relevant sources, with clear and substantive needs assessment.

### III NATIONAL TAXONOMIC NEEDS AND CAPACITY ENHANCEMENT

#### A. *Taxonomic needs identified in the 4<sup>th</sup> National Report and others*

21. “The results and lessons learned from regional taxonomic needs assessments and identification of priorities” were reported to SBSTTA (UNEP/CBD/SBSTTA/14/15). In this document the needs at the national level was not actively reported. To supplement the shortage of information regarding national level taxonomic needs, the Secretariat extracted the needs from the submissions of 4<sup>th</sup> National Reports from 164 Parties, particularly. Detailed results of this analysis is accessible at <http://www.cbd.int/gti/xxx> [this will be uploaded]

22. The results reported to SBSTTA from the analysis of the fourth National Reports identified several common needs. Key examples include:

(a) While there are varying degrees of taxonomic knowledge of endemic/endangered species, which has been acquired by Parties either directly (e.g. via taxonomical surveys, through in situ or ex situ collections) or indirectly (e.g. via literature) there appears to be a generalized dearth of taxonomic capacity, infrastructure and expertise at the national level, particularly but not exclusively in developing countries;

(b) There is a generalized need for increased monitoring activities, for greater local, national, regional and international collaboration and coordination, and for increased input by local and indigenous communities. Moreover, monitoring activities are not only essential to the identification of new species, they are also crucial to preserving endangered and critically endangered species, and monitoring progress on the status of biodiversity and future biodiversity goals and targets, including those of the Strategic Plan 2011-2020.

(c) Taxonomic knowledge is at the center of combating threats from invasive alien species, without it, misidentifications are made, thereby potentially exacerbating the ecological, agricultural, trade, health related issues caused by invasive alien species.

23. To support the taxonomic needs described above, many of the outcome-oriented deliverables for implementation of the programme of work for the GTI are already available online. For example:

(a) ABC Taxa,<sup>12</sup> published by Belgium’s GTI National Focal Point on the Holothurians in Comoros, Mollusca, Cryptocarya in Brazil, Amphibians in Cuba and Guyana, Seaweeds in Sri Lanka, Bees in sub-Saharan Africa, a manual for biodiversity inventories and others.

(b) A taxonomic Editor, known as the EDIT Platform for Cyber Taxonomy is freely available<sup>13</sup> for taxonomists and skilled amateur naturalists to publish monographs, databases, checklists, field guides and others online. For example, IOC-UNESCO Taxonomic Reference List of Harmful Micro Algae<sup>1415</sup>.

<sup>12</sup> <http://www.abctaxa.be/>

<sup>13</sup> <http://wp5.e-taxonomy.eu/cdm-setups/?q=node/3>

<sup>14</sup> <http://www.marinespecies.org/hab/index.php>

<sup>15</sup> <http://www.marinespecies.org/>

(c) Global Biodiversity Information Facility<sup>16</sup>, Encyclopedia of Life<sup>17</sup>, Ocean Biodiversity Information System<sup>18</sup> and UNEP-WCMC World Database on Protected Area<sup>19</sup>,

(d) The Biodiversity Heritage Library (BHL)<sup>20</sup> has created over 34,000,000 pages of taxonomic literature, including illustrations freely accessible through the collaboration of 12 natural history and botanical libraries from the UK and USA. In 2009, the BHL-Europe project,<sup>21</sup> combined the efforts of 28 European and American institutions, covering a wide range of scientific applications including taxonomic study and biodiversity conservation.

24. However, there is a clear need for training the end-users of taxonomy on how to use the existing taxonomic information in order to include more complete information on the status of biodiversity in their 5<sup>th</sup> and subsequent National Reports, and provide further opportunities to convey the information available on the status of biodiversity to the process of review for National Biodiversity Strategies and Action Plans.

25. In 2010, the Council of Canadian Academies published “Canadian Taxonomy: Exploring Biodiversity, Creating Opportunity” and reported on national capacity in taxonomy, access to Canadian biodiversity data and the strengths and challenges of Canadian taxonomy.<sup>22</sup> In this report, the following national capacity enhancement were suggested:

- (a) Enhancing capacity in digitizing specimen information.
- (b) Multi-disciplinary collaborations among universities, government agencies and ecology, physiology, collaboration with traditional knowledge holders.
- (c) Transferring taxonomic knowledge to the general public, including children.
- (d) Exchanging knowledge with so-called naturalists to build taxonomic capacity at the national level.
- (e) Integrating taxonomic work with:
  - i. Genetic techniques such as DNA barcoding;
  - ii. Strong taxonomic capacity in field-work;
  - iii. Inventories to promote biodiversity conservation; and
  - iv. Early detection of invasive alien species.

26. The report also highlighted that these issues are currently in the hands of highly-skilled but aging taxonomists, and the succession of this intellectual capacity to the next generation will be impossible unless strong action is taken. This includes: (i) training young taxonomists; and (ii) keeping the trained young taxonomists engaged in the process of implementation of the Strategic Plan and the Convention.

#### IV. RATIONALE FOR THE STRATEGY

27. The Global Taxonomy Initiative was established in recognition of the need for taxonomic input for many activities aimed at the conservation and sustainable use of biological diversity and of the lack of

<sup>16</sup> <http://data.gbif.org/countries/>

<sup>17</sup> <http://www.eol.org/>

<sup>18</sup> <http://www.iobis.org/>

<sup>19</sup> <http://protectedplanet.net/>

<sup>20</sup> <http://www.biodiversitylibrary.org/>

<sup>21</sup> <http://www.bhl-europe.eu/en/about-us>

<sup>22</sup> Expert Panel on Biodiversity Science, Canadian taxonomy:exploring biodiversity, creating opportunities. ISBN 978-1-926558-29-5

[http://www.scienceadvice.ca/uploads/eng/assessments%20and%20publications%20and%20news%20releases/biodiversity/biodiversity\\_report\\_final\\_e.pdf](http://www.scienceadvice.ca/uploads/eng/assessments%20and%20publications%20and%20news%20releases/biodiversity/biodiversity_report_final_e.pdf)

taxonomic capacity in the majority of countries (Annex to decision IV/1). The decision was based on resolving taxonomic impediment, as per the Darwin Declaration 1998.

*“The governments of the world that recognise the Convention on Biological Diversity have affirmed the existence of a taxonomic impediment to sound management and conservation of biodiversity. Removal of this impediment is a crucial, rate-determining step in the proper implementation of the Convention’s objectives.*

*---Darwin Declaration 1998 (UNEP/CBD/COP/4/Inf.28)*

28. The process for the removal of taxonomic impediments was rationalized in the programme of work for the GTI (annex to decision VI/8). The GTI was reviewed in-depth (decision VIII/3), and Outcome-Oriented Deliverables for the implementation of the GTI (Annex to decision IX/22) were determined to assist Parties, Governments, relevant organizations, local communities and all other end-users of taxonomic knowledge, data and information.

29. In coherence with the Strategic Plan for Biodiversity 2011-2020, Parties are invited to set their own national targets within this flexible framework, taking into account national needs and priorities (decision X/2) and the implementation of the Strategic Plan (decision X/5), in which the COP emphasizes the strengthening of national institutions to: ensure the effective provision, exchange and use of biodiversity-related information, provide monitoring of implementation, ensure policy coherence and facilitate coordination among sectors so as to promote implementation in all sectors. In the same decision, the following needs for the implementation were emphasized to update National Biodiversity Strategies and Action Plans:

- (a) Human-resource development, including training on technical topics and communication skills and stakeholder involvement, with emphasis on strengthening the expertise of local partners;
- (c) Strengthening of national institutions to ensure the effective provision, exchange and use of biodiversity-related information, to provide monitoring of implementation, and to ensure policy coherence and facilitate coordination among sectors so as to promote implementation in all sectors;
- (d) Strengthening of cooperation at regional and subregional levels;
- (e) Enhanced knowledge management to facilitate improved access to and effective use of relevant knowledge, information and technologies, through a strengthened central clearing-house mechanism and national clearing-house mechanism nodes, in accordance with national legislation;
- (f) Support to assess, on a scientific basis, the economic and other values of biodiversity and ecosystems in order to increase awareness and understanding of the importance of biodiversity, and thereby contribute to the mobilization of additional resources for the conservation and sustainable use of biodiversity.

30. The above needs are highly concordant with the planned activities of the programme of work for the GTI to fulfil taxonomic needs. The capacity-building strategy for the GTI should, therefore, not reinvent activities for capacity-building but more practically provide guiding implementation of the capacity building in all needs, and the implementation should be structured along the timeline of the updating process of National Biodiversity Strategies and Action Plans, National Reporting and the multi-year programme of work for the Conference of the Parties for the period 2011-2020.

31. Strengthening outreach activities of taxonomic experts to assist Parties, Governments and all relevant stakeholders is necessary (UNEP/CBD/GTI-CM/10/2)<sup>23</sup> to ensure existing taxonomic information, data, and knowledge will be utilized fully, as a common intellectual asset, and contribute to the Mission of the Strategic Plan, so that “...biodiversity issues and values mainstreamed, appropriate

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<sup>23</sup> <http://www.cbd.int/doc/meetings/gti/gticm-10/official/gticm-10-03-en.pdf>

policies are effectively implemented, and decision-making is based on sound science and the precautionary approach” (decision X/2). This should also serve to enrich existing information on the status of biodiversity to be referred in the 5<sup>th</sup> and 6<sup>th</sup> National Reports.

32. After almost a decade since the adoption of the programme of work, taxonomic methodology of taxonomy has advanced with DNA sequencing and phylogenetic systematics, and computer applications to assist morphology-based classifications became equally accessible to taxonomists and non-taxonomists on Internet. The Taxonomy Strategy should nourish such cybernetic interactions and encourage collaboration among stakeholders.

33. Taking into account the progress made for the GTI, the capacity-building strategy for the GTI includes:

- (a) General purpose of this strategy;
- (b) Vision of the Taxonomy Strategy further inspiring the Vision of the Strategic Plan for Biodiversity 2011-2020;
- (c) Mission of the Taxonomy Strategy to support the Mission of the Strategic Plan for Biodiversity 2011-2020;
- (d) Global actions proposed as taxonomic imperatives to provide guidance on national and regional actions, a rationale for actions, and add suggested work areas and actors, as appropriate;
- (e) Bridging activities to frame global and local actions, including reflections on the GTI for National Strategies and Action Plans;
- (f) Supporting the assessment of biodiversity in National Reports;
- (g) Engaging stakeholders, including donors, to implement the GTI;
- (h) Monitoring progress, including indicators for taxonomic capacity building.

#### *Annex*

### **DRAFT STRATEGY FOR TAXONOMIC CAPACITY BUILDING 2011-2020**

1. The purpose of the Strategy for Taxonomic Capacity Building 2011-2020 (Taxonomy Strategy) is to promote the effective use of taxonomic knowledge and information for Parties, Governments, organizations and other stakeholders to implement the Convention, achieve the goals of the Strategic Plan for Biodiversity 2011-2020 and Aichi Biodiversity Targets, at national, regional and global levels. The Taxonomy Strategy seeks to catalyze the environmental imperative of Parties, encouraging them to take actions at the national level, particularly in updating National Biodiversity Strategies and Action Plans, in strong collaboration with information commons and international research communities. The Taxonomy Strategy is composed of a VISION to act by 2050, MISSION to achieve by 2020 and ACTIONS to take as taxonomic imperatives between 2011 and 2020.

#### **A VISION**

2. The vision of this Strategy is to ensure that by 2050, global biodiversity is ubiquitously studied in its components as species, genetic variations and functioning elements of the ecosystems and biodiversity information with the ascertained taxonomy and knowledge on biodiversity is widely shared by every citizen living in harmony with nature.

#### **B MISSION**

3. By 2020, the actions of taxonomic imperative will be in place, and reflected, most notably, in updated National Biodiversity and Action Plans and each action will be undertaken in a timely fashion to achieve Target 19 of Aichi Biodiversity Targets.

### C ACTIONS OF TAXONOMIC IMPERATIVE 2011-2020

4. Parties, Governments, relevant organizations and all stakeholders of the CBD shall consider the following actions as taxonomic imperatives:

**ACTION 1:** By 2013, identify prioritized area for taxonomic capacity-building in terms of thematic areas, cross-cutting issues, habitats or ecosystems or group of organisms to target action at the national level by undertaking the assessment of taxonomic needs by all stakeholders, and include this work into the updated National Biodiversity Strategies and Action Plans, as a taxonomic imperative.

**Rationale:** In 2014 or early 2015 the twelfth meeting of the Conference of the Parties will review the updated national biodiversity strategies and action plans (decision X/9). Taxonomic imperatives should be clearly indicated in national strategies by COP12. The imperatives should also be based on the needs of taxonomic information by Parties, Governments, relevant organizations, local communities, industry and all relevant stakeholders.

**Suggested actors or deliverables:** CBD National Focal Points, SBSTTA Focal Points, GTI National Focal Points and relevant ministries in the environment, agriculture, forestry, fishery sectors of governments; taxonomic experts, international organizations, and networks such as BioNET INTERNATIONAL.

5. **ACTION 2:** By 2014, organize a training workshop of the CBD and GTI National Focal Points to improve access to and sharing of knowledge, data and information on biodiversity, in collaboration with the Secretariat, as appropriate, to facilitate cross-sectoral communication within the government, and between the government and academics, and to fully utilize the existing taxonomic capacity and outcome-oriented deliverables for the GTI for national reporting regarding the status of biodiversity and other relevant thematic areas and cross-cutting issues under the Convention.

**Rationale:** Parties will submit their 5<sup>th</sup> National Reports by the 31 March 2014 to monitor and report on the status of biodiversity. Taxonomic information and other associated information on biodiversity can be used more effectively with appropriate communication between information providers, the CBD and GTI National Focal Points and relevant government sectors. This communication may promote collaboration between relevant ministries, and institutions and assist in the implementation of further actions between 2015-2020.

**Suggested actors or deliverables:** CBD National Focal Points, SBSTTA Focal Points, GTI National Focal Points and relevant ministries in the environment, agriculture, forestry, fishery sectors of governments; taxonomic experts, international organizations and networks and databases, such as BioNET INTERNATIONAL, GBIF, UNEP-WCMC, and GEO-BON.

6. **ACTION 3:** By 2015, produce field guides for priority areas, such as selected protected areas including marine protected areas, and other priority areas of national or regional biodiversity, such as invasive alien, as appropriate, in coordination with CBD and GTI National Focal Points, in an effort to increase public awareness about biodiversity, including among volunteer naturalists, and local and indigenous people, to meet Target 1, 5, 9 and/or 11 of Aichi Biodiversity Targets, and present the field guide at the twelfth meeting of the Conference of the Parties, as appropriate.

**Rationale:** In compliance with decision V/17 on education and public awareness, carried out jointly by the Secretariat of the Convention on Biological Diversity and UNESCO, planned

activity 4 of the programme of work (public awareness and education), and recognizing the importance of volunteer naturalists and local and indigenous people as a source of expertise (paragraph 11e of decision VIII/3), to meet Target 1 of Aichi Biodiversity Target. The production of field guides will contribute to involvement by the public and wide range of stakeholders to assist in the monitoring of biodiversity, as parataxonomists. Presenting field guides as a contribution to Target 1 during COP12 also encourages synergy between taxonomic experts and the environmental sector at the national level.

**Suggested actors or deliverables:** CBD National Focal Points, SBSTTA Focal Points, GTI National Focal Points, national or municipal parks, taxonomic institutions, the education and tourism sectors, media, biodiversity databases, volunteer naturalists, indigenous and local communities.

7. **ACTION 4:** By 2015, review human capacity and infrastructure to maintain and pass on taxonomic expertise to the next generation, in order to identify and monitor biodiversity, particularly on invasive alien species, threatened species and socio-economically important species, including species which can be indicators of changes in climate, habitat, levels of pollutant and other environmental pressures to biodiversity. The review can be undertaken either at the national level or through the existing networks of taxonomic institutions, as a part of national reporting process.

**Rationale:** A key objective in the programme of work for the GTI is to address global and regional capacity-building needs, particularly those of developing countries. The aim is therefore to provide taxonomic information to support the implementation of the Strategic Plan by 2015. Key institutions involved in practices associated with Actions 1-3 of the Taxonomy Strategy will have prioritized capacity needs to support the implementation of the Strategic Plan. Such capacity needs should be assessed and fulfilled to ensure an adequate implementation of the Strategic Plan. It has the added advantage of coinciding with the 2015 mid-term review of the progress on the implementation of the Strategic Plan, including its programme of work. The timing of information on human capacity and infrastructure of the key institutions involved in the Taxonomy Strategy would contribute to the preparation of the post mid-term implementation of the Strategic Plan.

**Suggested actors, not exclusively, may include:** CBD and GTI National Focal Points, taxonomic institutions including universities, natural history museums, botanical gardens, herbaria, BioNET-INTERNATIONAL, the Global Biodiversity Information Facility, IUCN, and CAB International.

8. **ACTION 5 :** By 2017, build and maintain the systems and infrastructure needed to implement national targets, which may include facilities to collate, curate and track the use of the biological specimens and genetic resources.

**Rationale:** To follow-up on the capacity requirements reviewed in ACTION 4 of the Taxonomy Strategy, and to meet the needs emphasized in decision X/5, Parties, Governments and taxonomic institutions should initiate dialogue with the financial sector to build infrastructure for taxonomic capacity-building. The mid-term review of the progress on implementation of the Strategic Plan, including its programme of work in 2015, will have provided an opportunity to promote dialogue between the education and environmental sector in an effort to fulfil the financial gap for taxonomic institutions contributing to the implementation of the GTI.

**Suggested actors, not exclusively, may include:** CBD and GTI National Focal Points, taxonomic institutions including universities, natural history museums, botanical gardens, herbaria and other stakeholders, including donors, aid agencies, ministries for education and the environment.

9. **ACTION 6:** By 2018, secure human resources to build and maintain the collections of biological specimens and genetic resources at newly built or maintained facilities with ACTION5, to implement the national targets with strong expertise in systematics and information technology needed by Parties.

**Rationale:** To follow-up on ACTION 5, new and existing infrastructure will be fully utilized by hiring trained taxonomists. The job opportunity for young taxonomists will also secure the succession of knowledge and facilitate capacity-building in taxonomy.

**Suggested actors:** CBD and GTI National Focal Points, taxonomic institutions including universities, natural history museums, botanical gardens, herbaria and other stakeholders including donors, ministries for education and the environment, aid agencies.

10. **ACTION 7:** By 2020, present the status of biodiversity at national or regional levels with a comprehensive list of known species including information on abundance, distribution, functioning in the ecosystem and, wherever possible, analyse the fluctuation of the status of biodiversity over time at regional and global levels so that it may be included in the Strategic Plan beyond 2020.

**Rationale:** In 2020, the COP will review the implementation of the Strategic Plan and assess progress on achieving Aichi Biodiversity Targets, based, *inter alia*, on the sixth National Reports (decision X/9). One of the ultimate goals of the use of taxonomic information is to predict the status of biodiversity with various scenarios of environmental pressure, such as climate change. To fulfill this objective taxonomic and associated information on ecosystems must be included in the sixth National Report by Parties. This action may also reveal any missing information for the period beyond 2020.

**Suggested actors, not exclusively, may include:** GEO-BON, GBIF, Encyclopedia of Life, OBIS, UNEP-WCMC, IUCN, DIVERSITAS, other academic and environmental institutes, [IPBES].

11. **ACTION 8:** By 2020, initiate a national project to produce an inventory for all species in priority areas, such as selected protected areas, local communities or sustainable biodiversity management zones, such as SATOYAMA-like landscapes, in an effort to incorporate solid information about national biodiversity, regarding conservation and sustainable use, in decision making.

**Rationale:** To maximize the value of established human capacity and infrastructure for taxonomy under ACTIONS 5 and 6, and to enrich existing biodiversity information in digitized and other forms. Species inventories are an effective approach to maintaining taxonomic expertise at the networked taxonomic institutions. The practice of identifying a wide range of taxa supports maintaining human capacity in key institutions, and the identification of specimens by skilled taxonomists remain as reference specimens at the institutions with DNA sequence information. This will be the asset for subsequent generations to research on biodiversity. Of note, an indicator for taxonomic capacity is proposed with status of inventorying and it will be discussed at the Ad Hoc Technical Expert Group meeting which will be held in June 2011. The all species inventory will provide numerical indication as an indication of taxonomic capacity if this action can be carried out before 2020.

**Suggested actors, not exclusively, may include:** Natural history museums, botanical gardens, herbaria, culture collections, other academics and environmental institutes at national level. At the international level, BioNET INTERNATIONAL, CAB International, International Barcode of Life, IUCN, and the Consortium of Science Partners for Biodiversity.

12. **ACTION 9:** By 2020 establish Regional or National Taxonomy Initiatives to sustain taxonomic capacity acquired for the implementation of the GTI and the Convention, with clear action plans for

regional or national taxonomy imperatives, so future generations may expand on knowledge and technology in the field of systematics beyond 2020.

**Rationale:** At its meeting in 2020, the Conference of the Parties will conduct a review of the implementation of the Convention and the Strategic Plan for Biodiversity 2011-2020. Capacity-building achievements in taxonomy and whether national or regional actions were taken in a timely manner under this Taxonomy Strategy will be assessed in parallel with the assessment of progress on the achievement of Aichi Biodiversity Targets. Progress on Target 19 can be assessed by countries that partake in a national or regional taxonomy initiative.

**Suggested actors:** CBD and GTI National Focal Points, Governments, Natural history museums, botanical gardens, herbaria, culture collections, other academic and environmental institutes at the national level, At the international level, BioNET INTERNATIONAL, CAB International, International Barcode of Life, Consortium of Science Partners for Biodiversity.

13. **ACTION 10:** By 2020, develop national or regional strategies and action plans to implement the Taxonomy Initiative beyond 2020, in an effort to maintain and further improve knowledge, the science base and technologies relating to biodiversity with a global inventory of ubiquitous species by 2050.

**Rationale:** Capacity development and maintaining taxonomic capacity requires long-term vision. technology enriched morphology based taxonomy with DNA sequencing, databases associated with social networks and information commons on the Internet. Technological progress and social needs in terms of taxonomic information may change considerably between 2011 and 2020. Long-term plans should be adjusted in accordance with such technological advances and new social needs in timely manner.

**Suggested actors:** CBD and GTI National Focal Points, Governments, natural history museums, botanical gardens, herbaria, culture collections, other academic and environmental institutes at the national level. At the international level, BioNET INTERNATIONAL, CAB International, International Barcode of Life, Consortium of Science Partners for Biodiversity.

#### **D. IMPLEMENTATION, MONITORING, REVIEW AND EVALUATION**

14. **Means for implementation:** The implementation of the Taxonomy Strategy is primarily undertaken at the national level with enhanced international collaboration and multi-disciplinary participation. The Taxonomy Strategy provides a flexible framework for national and regional ACTIONS which should be reflected in National Biodiversity Strategies and Action Plans as a taxonomic imperative. The goal of Target 19 of Aichi Biodiversity Targets should also be included, with regards to the GTI, in the Strategic Plan for Biodiversity 2011-2020. The means for implementation include training/workshop for CBD and GTI National Focal Points to communicate cross-cutting sectors that require taxonomic information. The GTI Coordination Mechanism, as a direct advisory body to the Executive Secretary, will play a crucial role in engaging providers of taxonomic information in the implementation of the Strategic Plan for Biodiversity 2011-2020 at regional and global levels. Relevant international organizations, partners, and scientific community members will be invited to take actions with revised terms of reference for the Coordination Mechanism for the GTI<sup>24</sup>

15. **Programme of work:** The planned activities of the programme of work for the GTI continues to guide Parties, Governments, relevant organizations and all stakeholders to take actions in the Taxonomy Strategy. Advanced technologies and innovations for the identification and monitoring of species, and facilitating information-sharing should actively be incorporated in the actions taken for national and international projects indicated in the programme of work.

<sup>24</sup> Currently approved by SBSTTA bureau as interim bases.

16. **Financial mechanism:** The cross-cutting nature of the GTI should be considered at all levels and the projects at national and international levels under the Taxonomy Strategy must be developed with the assurance of contributions to the implementation of the Strategic Plan for Biodiversity 2011-2020. This will contribute to ensuring that the financial mechanism for the Strategic Plan (decision X/3) funds projects based on credible science and the needs of Parties, as set out in decision X/5.

17. **Partners:** In compliance with the Strategic Plan for Biodiversity 2011-2020, the involvement of all stakeholders, enhanced collaboration between national institutes and international networks, and inter-disciplinary commitments to develop information on biodiversity that is shareable are vital. Communication between academics, those who implement the CBD and biodiversity related Conventions, and other relevant bodies, including the inter-agency liaison group on invasive alien species,<sup>25</sup> needs to be further enhanced to maximize knowledge and information delivered through the ACTIONS of the Taxonomy Strategy.

18. **Review of the implementation:** The ACTIONS taken by Parties can be included in the 5<sup>th</sup> and 6<sup>th</sup> National Reports as milestones on the progress towards Target 19, in accordance with paragraph 3 of decision X/2, taking into account the indicator for capacity-building in taxonomy (paragraph 18 of decision X/39) which is currently under preparation by the Ad Hoc Expert Group for indicators (decision X/7). The review of implementation on the Taxonomy Strategy can also be undertaken by the Secretariat in collaboration with the coordination mechanism or GTI and the report will be submitted to the Working Group of Review and Implementation, as appropriate.

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<sup>25</sup> <http://www.cbd.int/invasive/lg/>