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

*Note by the Executive Secretary*

#### **EXECUTIVE SUMMARY**

Noting that taxonomic information underpins the capacity of Parties to identify, monitor, and predict the future status of biodiversity, this note presents a comprehensive capacity-building strategy for the Global Taxonomy Initiative (GTI) developed in collaboration with the Coordination Mechanism. The GTI Capacity-building Strategy provides a flexible global and/or regional framework that can strengthen taxonomic capacity at national and international levels with the engagement of multiple stakeholders for the implementation of the Convention and the programme of work on the Global Taxonomy Initiative. The note also describes taxonomic needs and related capacity needs for the implementation of the Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets. The GTI Capacity-building Strategy with a vision, mission and 10 actions addresses human resource and infrastructure development, knowledge management, regional cooperation and inter-disciplinary research. Implementation of the GTI Capacity-building Strategy is aligned with the timeline of the implementation of the Strategic Plan for Biodiversity 2011-2020.

#### **SUGGESTED RECOMMENDATIONS**

The Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) may wish to recommend that the Conference of the Parties adopt a decision along the following lines:

*The Conference of the Parties*

1. *Endorses* the comprehensive Capacity-building Strategy for the Global Taxonomy Initiative (GTI Capacity-building Strategy) that addresses the Strategic Plan for Biodiversity 2011-2020, as annexed hereto;

\* UNEP/CBD/SBSTTA/15/1/Rev.1.

2. *Invites* Parties and other Governments to integrate the actions of the GTI Capacity-building Strategy in their updated national biodiversity strategies and action plans (NBSAPs) taking into account that taxonomic capacity-building requires multi-disciplinary participation, and undertake the actions of the GTI Capacity-building Strategy in timely manner;

3. *Invites* relevant organizations, including, *inter alia*, taxonomic networks, scientific institutions and partners that contribute in capacity-building to further produce and maximize the use of the outcome-oriented deliverables for the implementation of the programme of work on the GTI annexed to decision IX/22;

4. *Requests* Parties to report on the effectiveness of their capacity-building efforts to support the implementation of the GTI within their fifth and sixth national reports to the Convention and *requests* the Executive Secretary to report on the progress of implementation of the GTI, based on the national reports received from Parties to the corresponding meetings of the Conference of the Parties and *invites* the corresponding body to review the implementation of the Convention to provide further guidance;

5. *Requests* the Executive Secretary, subject to the availability of financial resources, to organize:

(a) Regional workshops to assist Parties and the GTI national focal points to facilitate integration of the GTI Capacity-building Strategy in updated national biodiversity strategies and action plans;

(b) Workshops in collaboration with the GTI national focal points and partners to improve the taxonomic skills of a wide range of stakeholders in the context of the implementation of the Convention and accordingly;

(c) Develop, in collaboration with the GTI Coordination Mechanism and partners, a practical learning kit for the CBD and GTI National Focal Points to promote the GTI and facilitate their communication with all relevant stakeholders to strengthen the engagement of all relevant sectors and to support the actions of the GTI Capacity-building Strategy;

6. *Urges* Parties and *invites* other Governments, organizations and donors to provide adequate financial and technical support to the Executive Secretary for capacity development initiatives;

7. *Takes note* of the revised terms of reference for the Coordination Mechanism for the Global Taxonomy Initiative, contained in the information document (UNEP/CBD/SBSTTA/15/INF/5).

## I INTRODUCTION

1. In decision X/2 the Conference of the Parties (COP) adopted the Strategic Plan for Biodiversity 2011-2020 containing 20 Aichi Biodiversity Targets. In paragraph 16 of decision X/39, the Conference of the Parties requested the Executive Secretary, in consultation with the Coordination Mechanism for the GTI, national focal points for the initiative and relevant institutions, bodies and organizations, to develop a comprehensive capacity-building strategy for the GTI at global and regional levels that addresses the Strategic Plan for Biodiversity 2011-2020.

2. In response to this request, the Executive Secretary prepared this note, in consultation with the Coordination Mechanism, which met for its eleventh meeting on 3-4 June 2011, in Montreal. The rationale for developing the GTI Capacity-building Strategy at global and regional levels is described in section II. Relevance of GTI capacity-building to achieve the goals of the Strategic Plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets is described in section III. The draft GTI Capacity-building Strategy is annexed to the present document.

3. An earlier draft of this note was posted for review from 25 June to 14 July 2011 in accordance with notification 2011-123, and the comments received have been incorporated, as appropriate. This note

also has incorporated comments received from the Bureau of SBSTTA at a face-to-face meeting held on 5 and 6 June 2011 in Montreal.

## II RATIONALE FOR THE GTI CAPACITY-BUILDING STRATEGY

### A. *Capacity building needs to address the implementation the Convention on Biological Diversity and the Strategic Plan for Biodiversity 2011-2020*

4. In paragraph 1 of decision X/5, the Conference of the Parties described the type of capacity needed for the implementation of the Convention and the Strategic Plan for Biodiversity 2011-2020 which, *inter alia*, contains (i) human resource development; (ii) strengthening of national institutions and infrastructure; (iii) strengthening regional and subregional cooperation; (iv) enhanced knowledge management; and (v) support to assess, on a scientific basis, the economic and other values of biodiversity and ecosystems (interdisciplinary research).

5. The following GTI Capacity-building elements, taking into account decisions III/10 and IV/1 D were identified as the necessary to implement the Convention, especially Article 7 and Annex I, and the Strategic Plan for Biodiversity 2011-2020:

(a) Human resource development: taxonomists, para-taxonomists and information managers to undertake inventorying, monitoring and the further generation of taxonomic information;

(b) National institutions and infrastructure: facilities for collections of biological specimens, seeds, cultures, cells and genetic resources, libraries, and an information infrastructure to collate, curate and track the use of biological specimens and related information;

(c) Global, regional and subregional cooperation: for generating taxonomic information and its sharing and use;

(d) Knowledge management: improved access to and effective use of taxonomic knowledge, information and technologies, *inter alia* DNA sequence data based classification and geo-referenced species occurrence information, up-to date scientific names including information on conservation status and other ecological characters of the known species and electronic tools for identification of species;

(e) Interdisciplinary research: enriched information on status and distribution of biodiversity including social and economic valuation, its use for environmental assessment, analysis and modelling in response to climatic and other environmental changes.

### B. *What needs to be done to build capacity for the GTI*

6. The GTI Capacity-building Strategy should, in practical terms, provide strategic guidance to address the capacity-building needs mentioned above. Implementation is planned and aligned with the timeline of the updating process of national biodiversity strategies and action plans (NBSAPs), National Reporting (decision X/10) and the multi-year programme of work for the Conference of the Parties for the period 2011-2020 (decision X/9). Useful ways to capacity development include: (a) regional capacity development workshops; (b) technical support networks; (c) development of tool kits and (d) catalytic follow up actions etc.

7. There is a need to strengthen the engagement of all relevant stakeholders in capacity-building for the GTI. The CBD and GTI National Focal Points should work with relevant sectors of public administration to ensure that existing taxonomic information, data and knowledge are effectively utilized,<sup>1</sup> and contribute to the mission of the Strategic Plan for Biodiversity 2011-2020. The relevant sectors of national Governments, including the ministries/agencies of the environment, agriculture, forestry, fisheries, health, industrial development, and others should enhance cooperation to effective capacity-building for the GTI as one of the cross-cutting issues of the Convention. The Executive

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<sup>1</sup> UNEP/CBD/GTI-CM/10/2 <http://www.cbd.int/doc/meetings/gti/gticm-10/official/gticm-10-03-en.pdf>

Secretary, in collaboration with the GTI Coordination Mechanism and Partners may organize regional workshops for CBD and GTI National Focal Points, contingent on funding to enhance capacity in cross-sectoral cooperation with regards to implementation of the GTI Capacity-building Strategy.

8. Actors and partners include, *inter alia*, regional and international organizations such as the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), the Food and Agriculture Organization of the United Nations (FAO), including sector-specific databases (e.g. FAO-DAD-IS for livestock breeds), World Conservation Monitoring Centre of the United Nations Environment Programme (UNEP-WCMC), DIVERSITAS, the Group on Earth Observations Biodiversity Observation Network (GEO-BON), the Global Biodiversity Information Facility (GBIF), Barcode of Life (BOL), Encyclopedia of Life (EOL), the International Association of Plant Taxonomy (IAPT) and the International Union for Conservation of Nature (IUCN); and other biodiversity-related conventions, such as the Convention on International Trade in Endangered Species of wild fauna and flora (CITES) and the Convention on Migratory Species (CMS); academic institutions and local communities; regional and international collaborations and networks, such as the BioNET-International LOOPs, Botanic Gardens Conservation International (BGCI) and Science Collections International (SciColl). At the national and local levels, major natural history museums and large and small scale taxonomic institutions should collaborate to implement the GTI Capacity-building Strategy.

### *C. How the GTI Capacity-Building Strategy will work*

9. In accordance with decision X/5, the Conference of the Parties requested the Global Environment Facility to provide adequate and timely financial support for **the updating of national biodiversity strategies and action plans and related enabling activities**. The Conference of the Parties also invited other donors, Governments and multilateral and bilateral agencies to provide financial, technical and technological support to developing countries **to strengthen their capacities to implement the Convention, including support for relevant initiatives**.

10. The GTI Capacity-building Strategy provides the framework for the effective use of financial support from various donors, including Governments and multilateral and bilateral agencies, to implement Article 7 of the Convention and its Annex I, as well as the Strategic Plan for Biodiversity 2011-2020.

11. Implementation of the GTI Capacity-building Strategy is planned and aligned with the timeline of the implementation of the Strategic Plan for Biodiversity 2011-2020. Parties are invited to provide information on the existing capacity and progress on the implementation of the GTI Capacity-building Strategy in their fifth and sixth national reports. The Conference of the Parties in its corresponding meetings will review the progress and provide further guidance.

### **III. HOW TAXONOMY UNDERPINS THE IMPLEMENTATION OF THE STRATEGIC PLAN FOR BIODIVERSITY 2011-2020**

12. Taxonomic needs and related capacity needs for the implementation of the Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets based on the planned activities in the programme of work on the GTI are described in table 1.

Table 1: Taxonomic needs and related capacity needs for the implementation of Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets

<p><b>Strategic goal A. Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society</b></p> <p>Parties need to assess and monitor the effectiveness of measures taken addressing the underlying causes of biodiversity loss. Many of the causes are structural or sociological, but others will have a direct impact on biodiversity. Long-term monitoring of biodiversity status is required ultimately to assess the efficacy of any action. Biodiversity identification tools and the creation of an inventory for all species are fundamental to monitor the status of biodiversity and thereby important to achieving strategic goal A. This corresponds to Actions 4 and 8 of the GTI Capacity-building Strategy.</p>	
<p><b>AICHI BIODIVERSITY TARGET</b></p>	<p><b>TAXONOMIC RESOURCES AND CAPACITY NEEDED TO IMPLEMENT THE STRATEGIC PLAN FOR BIODIVERSITY 2011-2020</b></p>
<p><i>Target 1:</i> 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.</p> <p>The taxonomic needs identified are also relevant to Targets 2 and 5.</p>	<p>The importance and value of genetic, species and ecosystem biodiversity and the implications of its loss are dependent on the distribution of those levels of biodiversity at subnational, national, regional or global levels. Species inventories are required to record and retrieve such information, and to monitor the impact of conservation and manage sustainable use. Parties need access to a global checklist of biodiversity with national or regional taxonomic concepts. Human institutional and information management capacities to update, maintain such science and information bases are vital.</p>
<p><i>Target 4:</i> 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.</p>	<p>Parties' access to natural resources information must be supported by accurate and up-to-date taxonomy, in order to retrieve information on the natural resources targeted, and to identify, estimate and evaluate sustainable levels of production and consumption. Parties also need to gain the capacity to maximize the use of information above to plan and implement the Strategic Plan for Biodiversity. Parties also need integrated information on natural resources, including the distribution and abundance of key species. Improved information infrastructure is required.</p>
<p><b>Strategic goal B. Reduce the direct pressures on biodiversity and promote sustainable use</b></p> <p>Monitoring the status of biodiversity affected by direct pressures, and assessing the future status and trends of biodiversity, including the status of invasive alien species, are important to achieving strategic goal B. To support the monitoring process sufficient taxonomic information and human resources for identification of species, including alien species, are needed. This corresponds to actions 1, 3, 4, 6 and 8 of the GTI Capacity-building Strategy.</p>	
<p><i>Target 7:</i> By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.</p>	<p>Sustainable agriculture, aquaculture and forestry depend on how and which species, varieties and strains are used. Taxonomic information on, <i>inter alia</i>, crops, crop wild relatives, aquaculture fishes and production forest trees are important to manage production and sustainable use of resources in harmony with ecosystems. To achieve this target the capacity to meet the goals of the Global Strategy for Plant Conservation (decision X/17) is also highly relevant.</p>

<p><i>Target 8:</i> 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.</p>	<p>In addition to physical and chemical testing, biological indicators are often necessary and cost-efficient to monitor the health of an environment or ecosystem, and can inform on the longevity and cumulative effects of different pollutants on the ecosystem.<sup>2</sup> Skills to identify the indicator species are widely needed in conservation management<sup>3 4</sup> and impact assessments. Such human capacities for identification of species can be developed in close collaboration between taxonomic institutions and the relevant Government sectors. Communication between taxonomic experts and Governments needs to be further strengthened.</p>
<p><i>Target 9:</i> 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.</p>	<p>The identification of invasive alien species is a fundamental prerequisite for prevention, early detection and rapid response, control, management and eradication as well as accurate recognition of organisms on identified and prioritized invasion pathways. The identification of invasive alien species requires global collaboration in taxonomy, as does their management. As recognized by the Global Invasive Species Programme (GISP), services based on high quality biological collections and accurate species information<sup>5</sup> are required as well as sufficient human, infrastructural and information management, such as an information system of interoperable elements.</p>
<p><i>Target 10:</i> 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.</p>	<p><i>The fifth edition of the Status of Coral Reefs of the World: 2008</i>, noted that too many different methods were used to assess and monitor the pressures on coral reefs. It was indeed found that "... monitoring in many countries only covers a small and unrepresentative proportion of the reefs, such that the monitoring data are inadequate for a quantitative assessment."<sup>6</sup> Standardization of monitoring methods and integration of monitoring information are vital. Promotion of monitoring projects supported by sufficient human resources to identify marine organisms is needed for Parties to be able to receive accurate and comprehensive information on the status of biodiversity with long-term observation in the ecosystems, including marine and coastal areas. Observation of native species in its diversity and fluctuation of population size are particularly important for island States and countries with islands where biodiversity is vulnerable to invasive alien species and climate change.</p>

<sup>2</sup> Karr, James R. (1981). "Assessment of biotic integrity using fish communities". *Fisheries* 6: 21–27.

<sup>3</sup> *Biodiversity and Conservation* (2006) 15:4507–452.

<sup>4</sup> <http://www.taxonomytraining.eu/content/taxonomy-freshwater-macroinvertebrate-bioindicator-species>.

<sup>5</sup> R D Smith, G I Aradottir, A Taylor and C H C Lyal, 2008, *Invasive Species Management- what taxonomic support is needed?* Global Invasive Species Programme, Nairobi, Kenya.

<sup>6</sup> Wilkinson, C. (ed.), 2008 *Status of Coral Reefs of the World: 2008*, Global Coral Reef Monitoring Network and Reef and Rainforest Research Center, Townsville, Australia, p.10. Available at: [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).

**Strategic goal C. Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity**

Monitoring the status of biodiversity provides a basis for Parties to manage its use and ensure its conservation. Biodiversity identification tools, sufficient human resources to identify species, development of databases to keep monitoring records are all important to this effort. Parties need more human resources to conduct ecosystem and species monitoring. Data derived from long-term observation and included in databases are currently insufficient. Parties must have the capacity to develop and maintain such databases. This corresponds to actions 1, 4, 5, 6 and 8 of the GTI Capacity-building Strategy.

*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.

To establish well managed protected areas Parties need information on species richness and abundance in the area. Species distribution databases produced by taxonomic experts and through digital capture of data from taxonomic collections are indispensable to identifying priority areas for conservation, including Ecologically or Biologically Significant Areas. *For example, 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>7</sup> This report, which was then used as a baseline to establish protected areas in the region, stressed that the efficiency of such studies depends critically on the quality of the inventory data available. Promotion of inventory projects is important as science basis for protected area management in each country.

*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.

The taxonomic needs identified are also relevant to Targets 6 and 15.

Sustainable management of species and ecosystems relies on correct identification of its components. *For example 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>8</sup> In 2008, IUCN published the Red List of threatened species<sup>9</sup> with large numbers of contributors from the taxonomic sector. 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>10</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. To achieve this target, the capacity to meet the goals of the Global Strategy for Plant Conservation (decision X/17) is also highly relevant.

<sup>7</sup> Struebig MJ et al. *Biodivers Conserv* (2010) 19:449–469.

<sup>8</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>9</sup> <http://www.iucnredlist.org/initiatives/amphibians/analysis>.

<sup>10</sup> <http://www.iucnredlist.org/initiatives/amphibians/acknowledgements/conservation-partners>

<p><i>Target 13:</i> 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.</p> <p>The taxonomic needs identified are also relevant to target 7</p>	<p>Knowledge of the distinct breeds, varieties and populations that exist within domesticated species needs to be improved for safeguarding the genetic resources. 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>11</sup> The FAO Domestic Animal Diversity Information System includes descriptions and population figures for breeds of terrestrial domesticated animals. Such databases need to be maintained and regularly updated. <i>In-situ</i> and <i>ex-situ</i> conservation of species and genetic resource collections require accurate taxonomic identification. 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 transfer of technology, and capacity-building, in which taxonomy provides information on the wild relatives and useful characteristics of the species.</p>
<p><b><i>Strategic goal D: Enhance the benefits to all from biodiversity and ecosystem services</i></b></p> <p>To ensure ecosystem resilience Parties need to develop monitoring and management strategies; if ecosystems are degraded restoration programmes have to be implemented without disturbing native species and ecosystems. Conservation of genetic resources and conservation of specimens or wild relatives and other genetic resources in the context of introduction of Living Modified Organisms are also important. More infrastructure and human capacity are needed at <i>ex-situ</i> conservation facilities (e.g. seed banks, specimen and cell banks, gene banks) to support these activities. This corresponds to Actions 5, 6 and 7 of the GTI Capacity-building Strategy.</p>	
<p><i>Target 14:</i> 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</p>	<p>Development of functional bioindicators to monitor, <i>inter alia</i>, climate change, agricultural water waste and other pollution, and ecosystem services is vital for Parties. <i>For example, an elevation shift in plant species distribution can also be an indicator of water cycle and/or climate change.</i> Taxonomic research and data associated with more than 150 years of accumulated specimens in biodiversity collections can provide baselines with which to measure environmental change and assist early detection of such changes. Such institutes need to have the capacity to capture and deliver the necessary information.</p>
<p><i>Target 16:</i> 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.</p>	<p>Access to, and benefit-sharing arising from, the utilization of genetic resources requires accurate taxonomic information, so that providers and users agree on the identity of the genetic resource and can track its use. Specimens and associated taxonomic information provide insight on the distribution of genetic resources. Further human and infrastructural capacity is needed to identify biological (and genetic) resources at national level in a sustainable manner, and develop protocols to ensure quality control of such identifications. To ensure that countries which provide genetic resources receive non-monetary benefits such as training, capacity-building and technology transfer, taxonomic collaborations should be further promoted.</p>

<sup>11</sup> <http://www.fao.org/fishery/collection/asfis/en>.



<p><b><i>Strategic goal E. Enhance implementation through participatory planning, knowledge management and capacity-building</i></b></p>	
<p>Training workshops, biodiversity identification tools, review of human and other types of capacity, the development of databases using taxonomy, human resources and capital infrastructure, a list of known species, the creation of an all taxa inventory, and the monitoring of progress of implementation of this Capacity-building Strategy at national, regional and global scales are all important to the fulfilment of strategic goal E. This corresponds to all Actions of the GTI Capacity-building Strategy.</p>	
<p><i>Target 17:</i> 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.</p>	<p>Effective NBSAP implementation requires participation of all stakeholders. For example, indigenous and local communities (ILCs) are encouraged to collaborate with other stakeholders in citizen and community science to promote identification of local organisms to build local understanding and ownership of the NBSAP success. Capacity needs exists in access to and utilizing taxonomic information for implementation of the updated NBSAPs. Provision of biodiversity information in local languages with common names is required.</p>
<p><i>Target 19:</i> 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.</p>	<p>Monitoring biodiversity status and trends is highly dependent on the taxonomic capacity to identify, record and analyse collected biodiversity data. Taxonomic information on specimens and observations provided by experts is already accessible and suitable for some operations (e.g. Sampled Red List), but further coordination of research activities is needed to improve the quality and quantity of data to enable more widely effective application. Taxonomic information also supports analysis of biodiversity values, functioning, and consequence of loss, through application of names and mapping these against recorded data.</p>
<p><i>Target 20:</i> 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.</p>	<p>In light of the cross-cutting nature of the GTI, taxonomic capacity-building is crucial to achieving the Aichi Biodiversity Targets.</p>

*Annex***DRAFT COMPREHENSIVE CAPACITY-BUILDING STRATEGY FOR THE GTI**

1. The purpose of the Capacity-building Strategy for the Global Taxonomy Initiative is to develop the human resources and infrastructure necessary to generate, disseminate and use taxonomic knowledge and information that assist Parties, other Governments, organizations and that stakeholders can use to effectively implement the Convention and the Strategic Plan for Biodiversity 2011-2020 and to achieve the Aichi Biodiversity Targets.

2. The GTI Capacity-building Strategy seeks to catalyze national action, in an effort to better incorporate taxonomic information and needs in national biodiversity strategies and action plans (NBSAPs). The Capacity-building Strategy is composed of a *vision*, a *mission* and *actions* reflecting identified priorities in the view of regional and global levels.

3. The GTI Capacity-building Strategy is a flexible framework for the development of taxonomic capacity at global, regional and national levels.

**A. Vision**

4. By 2020, scientific knowledge of biodiversity is universally available and used at all levels of society in supporting decision-making on biodiversity related matters.

**B. Mission**

5. By 2020, Parties implement and collaborate in actions at national, regional and global levels in order to have the necessary taxonomic resources, including trained scientists in taxonomy, technologies and infrastructure, taxonomic information and data systems for use in the implementation of national biodiversity strategies and action plans, and as a contribution to achieve the Aichi Biodiversity Targets.

**C. Goals**

**Goal 1:** Parties, other Governments, relevant organization and every citizen *appreciate* existing taxonomic information and identify gaps and prioritize capacity-building needs.

**Goal 2:** The relevant organizations, partners and local institutions, including citizen scientists, *generate* the taxonomic information.

**Goal 3:** The relevant organizations, partners and networks *share* taxonomic information for Parties to make decisions on biodiversity at national, regional and global levels.

**Goal 4:** Parties, other Governments, relevant organizations and stakeholders to the Convention *use* taxonomic information to implement the programmes of work under the Convention and the Strategic Plan for Biodiversity 2011-2020 in timely manner.

**D. The strategic actions to take in 2011-2020**

6. Parties, other Governments and relevant organizations and stakeholders shall consider the following actions:

**Action 1:** By the end of 2012, review taxonomic needs and capacities at national and regional levels and set priorities to implement the Convention and the Strategic Plan for Biodiversity 2011-2020.

**Rationale:** Updated national biodiversity strategies and action plans (NBSAPs) will be reviewed by the twelfth meeting of the Conference of the Parties in 2014. The priority areas of capacity-building in taxonomy should be clearly indicated in the updated NBSAPs before COP-12. This action addresses target 17 of the Strategic Plan for Biodiversity 2011-2020. The

questionnaires for taxonomic needs and capacity assessments to be used for this purpose are included in an information document (UNEP/CBD/SBSTTA/15/INF/4).

**Relevant activity in the programme of work on the GTI:** Planned Activity 1: Country-based taxonomic needs assessments and identification of priorities.

Outcome oriented deliverables<sup>12</sup> in decision IX/22: outputs 1.1.1 and 1.1.2.

**Output of the action:** Integration of the GTI in reviewed regional and national biodiversity strategies and action plans.

**Action 2:** By the end of 2013, organize regional workshops aimed at informing CBD/GTI national focal points. It is envisaged that these workshops will facilitate the integration of the GTI Capacity-building Strategy in updated NBSAPs in collaboration with relevant government sectors, *inter alia* environment, agriculture, forestry, fisheries, education and sciences, landscape management and development sectors, as appropriate.

**Rationale:** This action promotes engaging the relevant ministries and institutions in further actions between 2015 and 2020 at the national level. This action addresses targets 1, 17 and 19 of the Strategic Plan for Biodiversity 2011-2020.

**Relevant activities in the programme of work on the GTI:** All planned activities in the 5 operational objectives.

**Capacity to be built or output of the action:** Engaging the relevant governmental sectors to implement the GTI Capacity-building Strategy.

**Action 3:** Organize additional workshops by 2014 to improve the taxonomic skills of a wide range of stakeholders in the context of the implementation of the Convention.

**Rationale:** The GTI Capacity-building Strategy requires well-trained professionals in taxonomy. It is necessary for professional taxonomists in the educational sector to increase the appeal of taxonomy and related biodiversity sciences. This action facilitates the sharing of experiences and ideas between professional taxonomists and other stakeholders. It also facilitates the development of recommended syllabus content to increase public awareness on taxonomic information necessary to implement the Convention, while also increasing the appeal of taxonomy as a subject to students, staff working for specimens collection and parataxonomists. This action addresses targets 1 and 19 of the Strategic Plan for Biodiversity 2011-2020.

**Relevant activities in the programme of work on the GTI:** All planned activities in the five operational objectives.

**Output of the action:** Engagement of professional taxonomists in the education sector to facilitate training in taxonomy and communication, education and public awareness activities.

**Action 4:** By 2015, produce and continue to share biodiversity identification tools (e.g. field guides, online tools, etc.) to develop an inventory of species and identify threatened species, invasive alien species, and species useful to agriculture.

**Rationale:** The existing and newly produced identification tools will assist Parties in the monitoring of biodiversity, early detection of invasive alien species and the implementation of other programmes of the Convention which require species identification. It is important to develop international technical standards and protocols for the characterization, inventory and monitoring of biodiversity for domesticated genetic resources and production environments, as appropriate. This action is especially important at the sub-specific level of taxa for some organisms where there are different sub-species, varieties, strains and biotypes that may have different levels of invasiveness, impacts in different ecosystems or different responses or reactions to biocontrol agents. This action

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<sup>12</sup> <http://www.cbd.int/doc/decisions/cop-09/cop-09-dec-22-en.pdf>.

addresses targets 1, 2, 5, 8, 9, 10, 11, 12, 13, 14 and 16 of the Strategic Plan for Biodiversity 2011-2020.

**Relevant activities in the programme of work on the GTI:** Planned activities 10-16 covering all thematic programmes, access and benefit-sharing, Article 8(j), invasive alien species and protected areas contained in decision VIII/3.

**Output of the action:** Species identification capacity necessary for protected area management, agriculture, invasive alien species control and management, species inventory and for all thematic area of the Convention.

**Action 5:** By 2015, review human capacity and infrastructure to identify and monitor biodiversity, particularly on invasive alien species, under-studied taxa, threatened and socio-economically important species, including indicator species. The review should be undertaken with regional networks and coordinated with national and international activities.

**Rationale:** In 2015, the Conference of the Parties will conduct mid-term review of the progress on the implementation of the Strategic Plan. This action should contribute to the preparation of the post mid-term implementation for Parties at all levels. The review can be undertaken at the national level and in collaboration with regional networks, as a part of the national reporting process. The review should be coordinated with national and international activities. This action addresses targets 17, 19 and 20 of the Strategic Plan for Biodiversity 2011-2020.

**Relevant activities in the programme of work on the GTI:**

Planned activity 5: Global and regional capacity-building to support access to and generation of taxonomic information, strengthening of existing networks for regional cooperation in taxonomy.

Planned activity 15: Invasive alien species.

**Output of the action:** Improvement of human capacity and infrastructure. Provide information for the Conference of the Parties to consider at the mid-term review of the Strategic Plan for Biodiversity.

**Action 6:** To the extent possible and commensurate with national capacity, build and maintain the information systems and infrastructure needed to collate, curate and track the use of biological specimens, and provide free and open access to the results of publicly-funded biodiversity research and related activities by 2015.

**Rationale:** To follow-up on capacity and infrastructure requirements reviewed in actions 5 of the GTI Capacity-building Strategy, Parties, other Governments and the financial sector including donors to build the infrastructure for taxonomic capacity-building, including the digitization of existing collections and information. This action addresses targets 1, 17, 19 and 20 of the Strategic Plan for Biodiversity 2011-2020.

**Relevant activities in the programme of work on the GTI:** Planned activity 7: Develop a coordinated global taxonomy information system.

**Output of the action:** Infrastructure to meet the needs of taxonomy, including information infrastructure.

**Action 7:** By 2017, establish the infrastructure necessary to build and maintain collections of biological specimens and genetic resources, including human resources.

**Rationale:** For effective implementation of the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization, maintaining the reference collections, reference tools, voucher specimens etc are of paramount importance. This action addresses targets 17, 19 and 20 of the Strategic Plan for Biodiversity 2011-2020.

**Relevant activities in the programme of work on the GTI:** Planned activity 7: Develop a coordinated global taxonomy information system.

**Output of the action:** Enhance human resources and institutional infrastructure.

**Action 8:** Improve the quality and increase the quantity of records in existing taxonomic databases used to generate computer models on the status of biodiversity at national or regional levels by 2019.

**Rationale:** In 2020, the Conference of the Parties will review the implementation of the Strategic Plan and assess progress in achieving the 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 model the status of biodiversity with various scenarios of environmental pressure, such as climate change. To fulfill this objective, the use of taxonomic and associated information on ecosystems must be included in the sixth national report by Parties. This action may also reveal missing information for the period beyond 2020. This action addresses targets 1, 2, 4, 5, 9, 10, 11, 12, 13, 14, 16 and 19 of the Strategic Plan for Biodiversity 2011-2020.

**Relevant activities in the programme of work on the GTI:**

Planned activity 7: Develop a coordinated global taxonomy information system.

**Output of the action:** Capacity of Parties to make science based decision making with information on status of biodiversity and potential loss/restoration of species, habitat or ecosystems under the given environmental scenarios.

**Action 9:** Facilitate the creation of an all-taxa inventory in targeted priority areas such as a protected area, local communities, sustainable biodiversity management zones, and socio-ecological production landscapes considered under the Satoyama Initiative. Projects may also include inventory, characterization and monitoring of domesticated genetic resources and their production environments, such as agriculture, forestry and fisheries, as appropriate, by 2019.

**Rationale:** This is catalytic action of the GTI capacity-building, which strongly accelerates generation of taxonomic information for Parties to make decisions with scientifically sound evidence on biodiversity. In addition, it supports local stakeholders to be engaged in biodiversity census. Taxonomic knowledge will be widely shared. This action enhances the involvement of young taxonomists and citizens to support conservation and sustainable use of biodiversity and ensure the human resource and capacity beyond 2020. This action addresses targets 1, 9, 10, 11, 12, 13, 14 and 19 of the Strategic Plan for Biodiversity 2011-2020.

**Relevant activities in the programme of work on the GTI:**

Planned activity 4: Public awareness and education

Planned activity 6: Strengthening of existing networks for regional cooperation in taxonomy

Planned activity 14: Access and benefit-sharing

**Output of the action:** Capacity to generate and share taxonomic information. Engagement of wide range of stakeholders to inventory projects. Enhancement of citizen science. Contribution to CEPA for biodiversity.

**Action 10:** Between 2018 and 2020, using the Aichi Biodiversity Target indicators relevant to taxonomy, monitor the progress in capacity-building Strategy for the GTI at the national, regional and global levels with a view to sustaining them beyond 2020.

**Rationale:** This action seeks to ensure long-term capacity-building activities at all levels. 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. At that time, capacity- building achievements in taxonomy should be assessed in parallel with progress on the achievement of the

Aichi Biodiversity Targets. Using the proposed indicator for taxonomy,<sup>13</sup> progress on target 19 and other relevant targets can be assessed by countries partaking in national and/or regional taxonomy initiatives as well as the progress reported by Parties and other Governments. Some possible additional indicators are: (i) process indicators: number of trained people; number of workshops organized; (ii) output indicators: number of training materials produced; number of taxonomic tools; (iii) results/progress indicators: increase in taxonomic studies and publications (globally, per region). This action addresses all Targets, particularly 1 and 19 of the Strategic Plan for Biodiversity 2011-2020.

**Relevant activities in the programme of work on the GTI:** Planned activity 5 but also relevant to all other planned activities of the programme of work.

**Output of the action:** Review of implementation of the GTI Capacity-building Strategy. Information to develop the Strategy beyond 2020.

## E. IMPLEMENTATION, MONITORING, REVIEW AND EVALUATION

**Means for implementation:** The GTI Capacity-building Strategy will be implemented primarily through activities of regional and global collaboration for research, monitoring and assessment with participation of wide range of stakeholders at national level and supporting action. Implementation of the global and regional Capacity-building Strategy will be initiated by the Executive Secretary in collaboration with the GTI Coordination Mechanism and in assistance with the GTI national focal points. Integration of the GTI and its programme of work to updated NBSAPs will be undertaken at the national level, and whenever possible also at the regional level. The Strategy will enhance international collaboration and interdisciplinary participation. The Capacity-building Strategy provides a flexible global framework for national and regional actions. The means for implementation include, but are not limited to, regional workshops for the Convention on Biological Diversity and/or GTI National Focal Points to enhance cooperation with sectors that require taxonomic information, such as the agencies for science, education, agriculture, forestry, fisheries, landscape management and development, and to assist taxonomic capacity-building, including trainings with wider initiatives and partners relevant to the Convention on Biological Diversity. The GTI Coordination Mechanism, as a direct advisory body to the Executive Secretary, will play a crucial role in engaging providers and users of taxonomic information in the implementation of the Strategic Plan for Biodiversity 2011-2020 at regional and global levels. Relevant international organizations, partners, taxonomic institutions and multi-disciplinary scientific community members will be invited to take actions. The revised terms of reference for the Coordination Mechanism<sup>14</sup> for the GTI provides information on how the Coordination Mechanism will take a pivotal role among the relevant governmental sectors and other stakeholders.

**Programme of work:** The planned activities of the programme of work on the GTI continues to guide Parties, other Governments, relevant organizations and all stakeholders to take actions in the time period between 2011 and 2020. 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.

**Capacity-building for effective global action:** Many Parties, especially the developing countries, in particular the least developed countries, small island developing States and the most environmentally vulnerable countries, as well as countries with economies in transition, may require support for the integration of the activities of GTI into NBSAPs, revised and updated in line with the Strategic Plan for

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<sup>13</sup> At its fifteenth meeting, SBSTTA will consider under agenda item 3.1 updated technical rationales and indicators for the Strategic Plan for Biodiversity 2011–2020 (UNEP/CBD/SBSTTA/15/3).

<sup>14</sup> UNEP/CBD/SBSTTA/15/INF/5.

Biodiversity 2011-2020. The GTI Capacity-building Strategy could provide technical support and the regional workshops could facilitate peer-to-peer exchange, complementing national capacity.

**Clearing-house mechanism:** In accordance with paragraph 22 of decision X/2 a biodiversity knowledge network will be developed, including a database and network of practitioners, to bring together knowledge and experience and to make it available through the clearing-house mechanism to facilitate and support enhanced implementation of the Convention.<sup>15</sup> National clearing-house mechanism nodes comprising networks of experts with effective websites should be developed and sustained so that in each Party, all have access to the information, expertise and experience required to implement the Convention. Actors and partners<sup>16</sup> involved in the implementation of the GTI Capacity-building Strategy are invited to share relevant information through the clearing-house mechanism.

**Broadening cross-sectoral support:** Parties to the Convention should be encouraged to strengthen the engagement of all relevant sectors, to support the actions, *inter alia*, actions 5-7 of the GTI Capacity-building Strategy, taking into account that museums, botanical gardens, taxonomic institutions and other relevant expertise are not always under the administration of environmental ministry/agency of the Governments, and ensure that the actions and activities will be in place in a timely manner for maintaining and newly establishing infrastructure and human resources, as appropriate.

**Broader partnerships and initiatives to enhance cooperation:** In accordance with paragraph 24 of decision X/2, cooperation will be enhanced with the programmes, funds and specialized agencies of the United Nations system as well as conventions and other multilateral and bilateral agencies, foundations and non-governmental organizations<sup>17</sup> and indigenous and local communities, to support implementation of the Strategic Plan for Biodiversity 2011-2020. Cooperation in the GTI Capacity-building Strategy will also be enhanced with the relevant regional bodies above to promote regional collaboration in the integration of actions of the GTI Capacity-building Strategy and ongoing generation of taxonomic information into broader initiatives. Initiatives of the Convention such as South-South cooperation,<sup>18</sup> promoting engagement of subnational governments, cities and local authorities,<sup>19</sup> and business and biodiversity<sup>20</sup> are relevant.

**Support mechanisms for research, monitoring and assessment:** In accordance with paragraph 25 of decision X/2 the followings are key support elements to ensure the effective implementation of the Strategic Plan and therefore it applies to the GTI Capacity-building Strategy:

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<sup>15</sup> The prospective Biodiversity Technology Initiative is relevant (decision X/6).

<sup>16</sup> Actors and partners include *inter alia* local, regional and international organizations such as the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) and the Group on Earth Observations Biodiversity Observation Network (GEO-BON), the Food and Agriculture Organization of the United Nations (FAO), the World Conservation Monitoring Centre of the United Nations Environment Programme (UNEP-WCMC), DIVERSITAS, the International Association of Plant Taxonomy (IAPT) and the International Union for Conservation of Nature (IUCN); other biodiversity-related conventions, such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Convention on Migratory Species (CMS); academic institutions and local communities; regional and international collaborations and networks, such as the BioNET-International LOOPS, Botanic Gardens Conservation International (BGCI) and Science Collections International (SciColl). At the national level, major natural history museums and large and small-scale taxonomic institutions should collaborate to implement the Strategic Plan for Biodiversity 2011-2020.

<sup>17</sup> Including, among others, UNEP, UNDP, the World Bank, FAO and IUCN.

<sup>18</sup> See also decisions IX/25 and X/23, on a multi-year plan of action for South-South cooperation on biodiversity for development for the period 2011-2020.

<sup>19</sup> Decision X/22 on the Plan of Action on Subnational Governments, Cities and other Local Authorities on Biodiversity. See also the Aichi/Nagoya Declaration on Local Authorities and Biodiversity (<http://www.cop10.jp/citysummit/english/images/top/declaration.pdf>).

<sup>20</sup> Decisions VIII/17, IX/26 and X/21.

(a) Global monitoring of biodiversity: work is needed to monitor the status and trends of biodiversity, maintain and share data, and develop and use indicators and agreed measures of biodiversity and ecosystem change;<sup>21</sup>

(b) Regular assessment of the state of biodiversity and ecosystem services, future scenarios and effectiveness of responses: this could be provided through an enhanced role for the Subsidiary Body on Scientific, Technical and Technological Advice as well as the proposed intergovernmental platform on biodiversity and ecosystem services;

(c) Ongoing research on biodiversity and ecosystem function and services and their relationship to human well-being;<sup>22</sup>

(d) The contributions of knowledge, innovations and practices of indigenous and local communities relevant to the conservation and sustainable use of biodiversity to all the above;

(e) Capacity-building and timely, adequate, predictable and sustainable financial and technical resources.

**Financial mechanism:** The cross-cutting nature of the GTI should be considered at all relevant governmental sectors to mobilize the funds necessary to develop sufficient capacity to implement the Convention. The projects at national and international levels under the GTI Capacity-building 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.

In accordance with decision X/5, funding opportunities should be made available for the implementation of the GTI Capacity-building strategy, particularly in least developed countries and small island developing States, as well as countries with economies in transition, to strengthen their capacities.

To achieve this, Parties should seek to: (i) integrate the GTI Capacity-building Strategy into updated NBSAPs; (ii) identify taxonomic needs and capacity needs; (iii) initiate and participate in projects supporting the implementation of revised NBSAPs in the context of national GTI capacity-building strategies; (iv) strengthen cross-sectoral collaboration and support broader initiatives to avoid duplication and effectively address cross-cutting issues; and (v) monitor and report the progress of capacity-building actions.

**Review of the implementation:** The actions taken by Parties should be included in the fifth and sixth national reports as milestones on the progress towards the Aichi Biodiversity Targets, in accordance with paragraph 3 of decision X/2, taking into account the use of indicators for capacity-building in taxonomy (paragraph 18 of decision X/39).<sup>23</sup> The Ad Hoc Expert Group for Indicators (decision X/7) reported that a taxonomic indicator can be “Number of maintained species inventories being used to implement the Convention” under the theme of ‘Accessibility of scientific/technical/traditional knowledge and its application’, relating to Aichi Biodiversity Target 19. It is recommended that each region / country establish an indicator in line with the above to evaluate their own achievement of the GTI Capacity-building Strategy. The review of implementation of the GTI Capacity-building Strategy can also be undertaken by the Secretariat in collaboration with the GTI Coordination Mechanism, and the report may be submitted to any forum of the Convention to review implementation, as appropriate.

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<sup>21</sup> The GEO-Biodiversity Observation Network, with further development and adequate resourcing, could facilitate this, together with Global Biodiversity Information Facility and the Biodiversity Indicators Partnership.

<sup>22</sup> This is facilitated by, *inter alia*, DIVERSITAS, the Programme on Ecosystem Change and Society and other global change research programmes of the International Council for Science (ICSU).

<sup>23</sup> UNEP/CBD/SBSTTA/15/3.