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COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

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REPORT FROM THE SECRETARIAT OF THE CONVENTION ON BIOLOGICAL DIVERSITY

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CGRFA 17

**OVERVIEW OF RECENT DEVELOPMENTS UNDER THE CONVENTION ON
BIOLOGICAL DIVERSITY AND ITS PROTOCOLS OF RELEVANCE
TO THE COMMISSION ON GENETIC RESOURCES
FOR FOOD AND AGRICULTURE**

1. The Secretariat of the Convention on Biological Diversity (CBD) is providing this brief report for the information of the seventeenth regular session of the Commission on Genetic Resources for Food and Agriculture (CGRFA). The Joint Work Plan 2011-2020 of the Secretariats of the CBD and CGRFA guides their collaborative work, including on the Cartagena Protocol on Biosafety and the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS).
2. The report covers activities since the 16th regular session of the CGRFA and focusses on inter-sessional activities relevant to the prioritized themes of the 17th regular session of the CGRFA as requested by its Secretariat as well as key outcomes from:
 - the fourteenth meeting of the Conference of the Parties to the Convention (COP-14),
 - the ninth meeting of the Conference of the Parties serving as the meeting of the Parties to the Cartagena Protocol on Biosafety (COP-MOP 9), and
 - the third meeting of the Conference of the Parties serving as the meeting of the Parties to the Nagoya Protocol on ABS (COP-MOP 3).

These meetings were held concurrently in November 2018 in Sharm El-Sheikh, Egypt.

Strategic Plan for Biodiversity 2011-2020 and development of the post-2020 global biodiversity framework

3. COP-14 adopted a decision providing an “Updated assessment of progress towards selected Aichi Biodiversity Targets and option to accelerate progress” which confirmed that despite many positive actions, most of the Aichi Biodiversity Targets are not on track to be achieved by 2020. The decision noted that, in the absence of further significant progress, the achievement of the mission and vision of the Strategic Plan for Biodiversity 2011-2020, and the Sustainable Development Goals, and ultimately the planet’s life support systems would be jeopardized. For Aichi Biodiversity Target 13 on maintaining genetic diversity, it was noted that the number of plant genetic resources for food and agriculture secured in ex situ conservation facilities shows an increase and called for enhanced actions to avoid further reduction in genetic variation among breeds of farmed and domesticated animals, and promote in situ conservation in centres of origin and genetic diversity.
4. COP-14 also adopted a decision on a comprehensive and participatory process for the preparation of the post-2020 global biodiversity framework (decision 13/34) in which partner organizations and processes were invited to actively engage and contribute to the process of developing a robust post-2020 global biodiversity framework in order to foster strong ownership of the framework to be agreed and strong support for its immediate implementation. The decision encourages relevant organizations and others to consider developing biodiversity commitments that may contribute to an effective post-2020 global biodiversity framework and to make such information available as a contribution to the Sharm El-Sheikh to Beijing Action Agenda for Nature and People. Furthermore, the COP invited the General Assembly of the United Nations to convene a high-level biodiversity summit at the level of Heads of State/Heads of Government in 2020 in order to raise the political visibility of biodiversity and its contribution to the 2030 Agenda for Sustainable Development and to the development of a robust post-2020 global biodiversity framework.
5. Decision 13/34 establishes an open-ended intersessional working group to support the preparation of the post-2020 global biodiversity framework and foresees that the framework will be adopted by the Conference of the Parties to the Convention at its fifteenth meeting to be held in 2020. The annex to decision 13/34 sets out in more detail the process for preparing the post-2020 global biodiversity framework. Among other things, the participation of focal points of other United Nations organizations, such as the Food and Agriculture Organization of the United Nations is encouraged in the process for developing the post-2020 global biodiversity framework. The annex also identifies a number of key sources of information that will be used in developing documentation related to the

post-2020 process and informing activities, including the *State of the World* reports and other assessment reports prepared by the Food and Agriculture Organization of the United Nations.

Conservation and sustainable use of pollinators

6. The Conference of the Parties adopted decision 14/6 on the conservation and sustainable use of pollinators on the basis of a recommendation from SBSTTA, and the Executive Secretary was requested to bring this decision to the attention of the Commission (para. 8). Accordingly, the text of the decision is provided in appendix I to this report. Through that decision, the Conference of the Parties adopted an updated Plan of Action 2018-2030 for the International Initiative for the Conservation and Sustainable Use of Pollinators. Moreover, The Conference of the Parties invited FAO to facilitate the implementation of the Plan of Action, following the successful approach of the previous plan involving ministries of agriculture and environment at the national level.

Cooperation with other conventions, international organizations and partnerships

7. The Executive Secretary submitted a report on cooperation with other conventions, international organizations and partnerships to the Subsidiary Body on Implementation at its second meeting¹. The Subsidiary Body on Implementation also considered: a progress report on implementation of the options for enhancing synergies at the national level and the road map for enhancing synergies among the biodiversity-related conventions at the international level during the period 2017 to 20202; a report on collaboration with the members of the Collaborative Partnership on Forests³; a summary of cooperation activities with other conventions, international organizations and partnerships⁴; and the report of the informal advisory group on synergies among biodiversity-related conventions⁵. The Subsidiary Body on Implementation prepared Recommendation SBI-2/9 for the consideration of the fourteenth meeting of the Conference of the Parties.

8. On that basis, the Conference of the Parties adopted decision XIV/30 in which it expressed, in paragraph 22, its appreciation for the effective cooperation of the Food and Agriculture Organization of the United Nations with the Convention, and, in this regard, welcomed the progress in the development of the report on the State of the World's Biodiversity for Food and Agriculture referred to in decision XIII/3, paragraph 40, that had invited FAO to consider developing a global plan of action on the basis of that report.

9. In paragraph 23 of decision XIV/30, the Conference of the Parties invites the Food and Agriculture Organization of the United Nations, in collaboration with other organizations and subject to the availability of resources, to consider the preparation of a report on the state of knowledge on soil biodiversity covering current status, challenges and potentialities and to make it available for consideration by the Subsidiary Body on Scientific, Technical and Technological Advice at a meeting held prior to the fifteenth meeting of the Conference of the Parties.

10. In paragraph 24, the Conference of the Parties requested the Executive Secretary to continue to work with the Food and Agriculture Organization of the United Nations to promote mainstreaming biodiversity in the agriculture, forestry and fisheries sectors.

Digital sequence information on genetic resources

11. The Conference of the Parties to the Convention on Biological Diversity at its thirteenth meeting and the Conference of the Parties serving as the meeting of the Parties to the Nagoya Protocol on Access and Benefit-Sharing at its second meeting each adopted decisions on digital sequence information on genetic resources in which they recognized the need for a coordinated and non-duplicative approach on this matter under the Convention and the Nagoya Protocol. These were decisions XIII/16 and NP-2/14, respectively.

12. In these decisions, the Parties decided to consider, at the fourteenth meeting of the Conference of the Parties and the third meeting of the Parties to the Nagoya Protocol, any potential implications of

¹ CBD/SBI/2/10

² CBD/SBI/2/10/Add.1

³ CBD/SBI/2/10/Add.2

⁴ CBD/SBI/2/INF/12

⁵ CBD/SBI/2/INF/14

the use of digital sequence information on genetic resources for the three objectives of the Convention, and for the objective of the Nagoya Protocol, respectively.

13. The decisions also set out a process to facilitate work on this matter during the inter-sessional period, i.e. 2017-2018. The process included the submission of views and information, the commissioning of a fact-finding and scoping study and a meeting of an Ad Hoc Technical Expert Group (AHTEG). The Secretariat of the Commission on Genetic Resources for Food and Agriculture submitted views received from its members and others as part of the submission process and also participated in the meeting of the AHTEG.

14. The outcomes of the AHTEG were submitted to the 22nd meeting of the Subsidiary Body on Scientific, Technical and Technological Advice which developed draft decisions for consideration by COP-14 and Nagoya Protocol COP-MOP 3. The Secretariat of the Commission on Genetic Resources for Food and Agriculture also submitted its fact-finding scoping study on digital sequence information on genetic resources for food and agriculture, which was made available as an information document for COP-14 and Nagoya Protocol COP-MOP 3.

15. The matter of digital sequence information on genetic resources was discussed extensively during the meetings of COP-14 and Nagoya Protocol COP-MOP 3 in Sharm El-Sheikh, Egypt in November 2018, resulting in the adoption of decisions 14/20 and NP-3/12. Among other issues, in decision 14/20, the Conference of the Parties noted that, as there is a divergence of views among Parties regarding benefit-sharing from the use of digital sequence information on genetic resources, Parties commit to work towards resolving this divergence through the process established in the decision, with the aim of strengthening the fulfilment of the third objective of the Convention and Article 15, paragraph 7, without prejudice to the circumstances to which this article applies.

16. To this end, the decision establishes a science and policy-based process on digital sequence information on genetic resources to be undertaken in the 2019-2020 inter-sessional period. The process includes the submission of views and information (i) to clarify the concept of digital sequence information on genetic resources, (ii) on benefit-sharing arrangements from the use of digital sequence information on genetic resources, and (iii) on capacity-building needs regarding the access, use, generation and analysis of digital sequence information on genetic resources.

17. The process also includes requests for the Executive Secretary to commission a number of studies on the following subject matters:

- a) the concept and scope of digital sequence information on genetic resources and how digital sequence information on genetic resources is currently used;
- b) ongoing developments in the field of traceability of digital information, including how traceability is addressed by databases, and how these could inform discussions on digital sequence information on genetic resources;
- c) public and, to the extent possible, private databases of digital sequence information on genetic resources, including the terms and conditions on which access is granted or controlled, the biological scope and the size of databases, numbers of accessions and their origin, governing policies, and the providers and users of the digital sequence information on genetic resources; and
- d) how domestic measures address benefit-sharing arising from commercial and non-commercial use of digital sequence information on genetic resources and address the use of digital sequence information on genetic resources for research and development, taking into account the submissions also to be provided on this matter.

18. The process also includes the establishment of an Ad Hoc Technical Expert Group (AHTEG) that will consider the submissions and the studies and develop options for operational terms and their implications to provide conceptual clarity on digital sequence information on genetic resources; and identify key areas for capacity-building. The AHTEG is to submit its outcomes for consideration by a meeting of the open-ended working group that has been established to support the preparation of the post-2020 global biodiversity framework. The open-ended working group is to make recommendations to the fifteenth meeting of the Conference of the Parties on how to address digital

sequence information on genetic resources in the context of the post-2020 global biodiversity framework.

19. The decision also requests the Executive Secretary to cooperate with other intergovernmental organizations to inform them of the process and to take into account the work, approaches and outcomes that these organizations generate in this area.

20. In decision NP-3/12, the Conference of the Parties serving as the meeting of the Parties to the Nagoya Protocol requested the open-ended working group to submit the outcome of its deliberations for consideration by COP-MOP 4.

Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization

21. The Nagoya Protocol has received 116 ratifications as of 11 January 2019. The third meeting of the Conference of the Parties serving as the meeting of the Parties to the Nagoya Protocol adopted a number of decisions relevant to the Commission on Genetic Resources for Food and Agriculture.

22. COP-MOP 3 conducted the first assessment and review of the effectiveness of the Protocol based on the information submitted by Parties in the interim national report on the implementation of the Nagoya Protocol and the ABS Clearing-House⁶, as well as other sources.

23. At the meeting, Parties had the opportunity to assess progress towards implementation, as well as identify successes and challenges to implementation. In decision NP-3/1, the meeting of the Parties welcomed the progress made by Parties, as well as non-Parties, in establishing legislative, administrative or policy measures on access and benefit-sharing (ABS) and institutional arrangements. However, it was also recognized that further efforts were needed to make the Protocol fully operational.

24. It was also recognized that much progress has also been made in making relevant information available through the ABS Clearing-House, particularly information on legislative, administrative or policy measures; national focal points and competent national authorities; and permits or their equivalent issued at the time of access.

25. Among other things, Parties, in view of the cross-cutting nature of the Protocol, were invited to establish appropriate mechanisms to facilitate national coordination among different institutions, including national focal points, competent national authorities and ministries of relevance to access and benefit-sharing. They were also invited to take into account, in the implementation of Article 8 of the Protocol, relevant work undertaken by the FAO, the World Health Organization and other relevant organizations, as appropriate and in accordance with national circumstances.⁷

26. Key findings and outcomes from this assessment can assist in advancing implementation of the Protocol and guiding future work to ensure the fair and equitable sharing of benefits and provide legal certainty to both providers and users of genetic resources and associated traditional knowledge.

27. In addition, the Secretariat of the CGRFA has participated in meetings of the informal advisory committee on capacity-building for the implementation of the Nagoya Protocol and the CBD Secretariat has participated as an observer in the Commission's Team of Technical and Legal Experts on Access and Benefit-sharing and also collaborated in the organization of the International Workshop on Access and Benefit-Sharing for Genetic Resources for Food and Agriculture held in January 2018. The importance of these collaborative efforts is reflected in the COP-MOP decision on cooperation with other conventions, international organizations and initiatives (decision NP-3/7).

28. The Executive Secretary was also requested to share decision NP-3/14 on specialized international ABS instruments in the context of Article 4, paragraph 4, of the Nagoya Protocol with,

⁶ The Access and Benefit-sharing Clearing-House: <http://absch.cbd.int>.

⁷ Information contained in the interim national report received from Parties and non-Parties to the Protocol on their implementation of Article 8(c) can be found in the ABS Clearing-House (<https://absch.cbd.int/reports/>). An analysis of the information submitted as of February 2018 is also available in the following document (<https://www.cbd.int/doc/c/767b/a3b0/e4934613a1a3fd1116b1c89a/sbi-02-inf-03-en.pdf>).

among others, the Commission on Genetic Resources for Food and Agriculture. Accordingly, the text of the decision is provided in appendix II to this report.

Cartagena Protocol on Biosafety

29. The Cartagena Protocol on Biosafety to the Convention on Biological Diversity (“Cartagena Protocol”) is an international treaty governing the movements of living modified organisms resulting from modern biotechnology from one country to another. The Cartagena Protocol was adopted on 29 January 2000 as a supplementary agreement to the Convention on Biological Diversity and entered into force on 11 September 2003. Presently, the Cartagena Protocol has 171 Parties.

30. In 2010, Parties adopted the Strategic Plan for the Cartagena Protocol on Biosafety covering the period 2011 to 2020. In decision CP-9/6, the meeting of the Parties decided that the fourth assessment and review of the Cartagena Protocol will be combined with the final evaluation of the Strategic Plan for the Protocol. This process is to be undertaken in the 2019-2020 inter-sessional period with the outcomes submitted to the tenth meeting of the COP-MOP.

31. Furthermore, COP-MOP 9 also adopted decision CP-9/7 on preparation for the follow-up to the Strategic Plan for Biodiversity 2011-2020 and the Strategic Plan for the Cartagena Protocol 2011-2020. In the decision, the COP-MOP stressed the importance of including biosafety in the post-2020 global biodiversity framework. It also decided to develop a specific Implementation Plan for the Cartagena Protocol on Biosafety post 2020 that is anchored in and complementary to the post-2020 global biodiversity framework. The COP-MOP also agreed on a process to facilitate and support the inclusion of the biosafety component in the post-2020 global biodiversity framework and towards the development of the Implementation Plan. This process includes opportunities to provide input and views.

32. COP-MOP 9 also acknowledged the need for a specific action plan for capacity-building for implementation of the Cartagena Protocol and its Supplementary Protocol (see below) that is aligned with and complementary to the Implementation Plan. The Implementation Plan and the action plan for capacity-building are expected to be adopted by the COP-MOP at its tenth meeting.

33. In 2010, the Nagoya – Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety was adopted providing international rules and procedures in the field of liability and redress relating to living modified organisms. The Supplementary Protocol entered into force on 5 March 2018 and currently has 43 Parties. At its ninth meeting, the COP-MOP requested the Executive Secretary to undertake a comprehensive study related to, amongst others, modalities of financial security mechanisms in the context of the Supplementary Protocol.

*Appendix I***Decision 14/6. Conservation and sustainable use of pollinators**

The Conference of the Parties,

Recalling decision [III/11](#), annex III, decision [V/5](#), decision [VI/5](#), and decision [XIII/15](#),

Noting the importance of pollinators and pollination for all ecosystems, including those beyond agricultural and food production systems, particularly to the livelihoods and culture of indigenous peoples and local communities, and *recognizing* the important contribution of activities to promote the conservation and sustainable use of pollinators and pollination functions and services in achieving the Aichi Biodiversity Targets as well as the Sustainable Development Goals,

Convinced that activities to promote the conservation and sustainable use of pollinators and pollination functions and services are key elements in the transition towards the achievement of more sustainable food systems by fostering the adoption of more sustainable practices among agricultural sectors and across sectors,

Adopts the Plan of Action 2018-2030 for the International Initiative for the Conservation and Sustainable Use of Pollinators as contained in annex I to the present decision, for implementation according to national legislation and national circumstances;

Takes notes with appreciation of the summary of information on the relevance of pollinators and pollination to the conservation and sustainable use of biodiversity in all ecosystems beyond their role in agriculture and food production, contained in annex II to the present decision;

Encourages Parties, other Governments and relevant organizations and networks to support and implement relevant activities of the International Initiative on the Conservation and Sustainable Use of Pollinators through, among other things, the integration of appropriate measures into the implementation of national biodiversity strategies and action plans, as well as subnational and local biodiversity strategies and actions plans, as appropriate, and relevant policies, legislation, and programmes;

Urges Parties and *invites* other Governments to address the drivers of wild and managed pollinators decline in all ecosystems, including the most vulnerable biomes and agricultural systems, and, as identified in annex II to the present decision, paying especially close attention at both the local and regional scales to the risk of introducing and spreading invasive alien species (plants, pollinators, predators, pests, parasites and pathogens) that are harmful to pollinators and to the plant resources on which they depend, and to avoiding or reversing land degradation and to restoring lost or fragmented pollinator habitats, in addition to addressing the drivers identified in decision XIII/15;

Encourages Parties and *invites* other Governments to integrate the conservation and sustainable use of wild and managed pollinators and their habitats into land management and protected areas and other effective area-based conservation policies;

Encourages Parties and *invites* other Governments:

(a) To encourage the private sector to take into consideration the activities listed in the Plan of Action and to work towards the achievement of more sustainable production and consumption systems;

(b) To encourage academic and research bodies, and relevant national, regional and international organizations and networks, to conduct further research to address gaps⁸ identified in the Plan of Action and to synthesize and communicate information through appropriate channels to support implementation;

(c) To encourage farmers, beekeepers, land managers, urban communities, indigenous people and local communities and other stakeholders to adopt pollinator-friendly practices and address direct and indirect drivers of pollinator decline at the field and local level;

⁸ Gaps identified in the Element 4 of the Plan of Action 2018-2030 presented in annex I.

(d) To develop and deploy monitoring of wild and managed pollinators in order to assess the magnitude of the decline and to evaluate the impact of deployed mitigation actions;

Encourages the Global Environment Facility and other donors and funding agencies to provide financial assistance, including capacity-building activities, for national and regional projects that address the implementation of the Plan of Action for the sustainable use and conservation of pollinators;

Requests the Executive Secretary to bring the present recommendation to the attention of the Food and Agriculture Organization of the United Nations and its Committee on Forestry, the Committee on Agriculture, the Commission on Genetic Resources for Food and Agriculture, the Committee on World Food Security, and the secretariats of the International Plant Protection Convention and the International Treaty on Plant Genetic Resources for Food and Agriculture as well as the Secretariat of the Basel, Rotterdam and Stockholm Conventions;

Invites the Food and Agriculture Organization of the United Nations to facilitate the implementation of the Plan of Action, following the successful approach of the previous plan involving ministries of agriculture and environment at the national level;

Also requests the Executive Secretary, subject to the availability of resources, and in collaboration with the Food and Agriculture Organization of the United Nations, the Secretariat of the Basel, Rotterdam and Stockholm Conventions and other relevant stakeholders, to develop guidelines and best practices in relevant areas, determined in accordance with the level of priority for the implementation of the Plan of Action, such as, among others, the use of chemicals in agriculture, protection programmes for native pollinators in natural ecosystems, promotion of biodiverse production systems, crop rotation, monitoring of native pollinators, and environmental education;

Requests the Executive Secretary to consider the conservation and sustainable use of wild and managed pollinators in preparations for the post 2020-global biodiversity framework;

Invites Parties, other Governments, research institutions and organizations that are in a position to do so to support countries that need (a) to increase taxonomic capacity in order to improve knowledge about pollinators, their status and trends, (b) to identify drivers of change in their populations, and (c) to develop appropriate solutions to enable effective adoption and implementation of the proposed action plan.

Annex I

UPDATED PLAN OF ACTION 2018-2030 FOR THE INTERNATIONAL INITIATIVE ON THE CONSERVATION AND SUSTAINABLE USE OF POLLINATORS

INTRODUCTION

1. At its third meeting, in 1996, the Conference of the Parties to the Convention on Biological Diversity recognized the importance of pollinators, and the need to address the causes of their decline (decision [III/11](#)). By decision V/5, the Conference of the Parties decided to establish an International Initiative for the Conservation and Sustainable Use of Pollinators as a cross-cutting initiative within the programme of work on agricultural biodiversity to promote coordinated action worldwide and, subsequently, by decision VI/5, adopted a plan of action. The Food and Agriculture Organization of the United Nations (FAO) has been leading and facilitating the implementation of the Plan of Action.

The present Plan of Action has been prepared jointly by FAO and the Secretariat of the Convention on Biological Diversity, in consultation with other partners and relevant experts, pursuant to decision [XIII/15](#) (para. 10).

I. OBJECTIVES, PURPOSE AND SCOPE

3. The overall objective of this Plan of Action is to promote coordinated action worldwide to safeguard wild and managed pollinators and promote the sustainable use of pollination functions and services, which is a recognized vital ecosystem service for agriculture and for the functioning and health of ecosystems.

4. The purpose of this Plan of Action is to help Parties, other Governments, indigenous peoples and local communities, relevant organizations and initiatives to implement decision XIII/15, in

alignment with the Strategic Plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets and the 2050 Vision for Biodiversity, the FAO Strategic Framework 2010-2019, and relevant successor frameworks, and the 2030 Agenda for Sustainable Development, including the Sustainable Development Goals.

5. The operational objectives of this Plan of Action are to support Parties, other Governments, indigenous peoples and local communities, relevant organizations and initiatives:

(a) In implementing coherent and comprehensive policies for the conservation and sustainable use of pollinators at the local, subnational, national, regional and global levels, and promoting their integration into sectoral and cross-sectoral plans, programmes and strategies;

(b) In reinforcing and implementing management practices that maintain healthy pollinator communities, and enable farmers, beekeepers, foresters, land managers and urban communities to harness the benefits of pollination for their productivity and livelihoods;

(c) In promoting education and awareness in the public and private sectors of the multiple values of pollinators and their habitats, in improving the tools for decision-making, and in providing practical actions to reduce and prevent pollinator decline;

(d) In monitoring and assessing the status and trends of pollinators, pollination and their habitats in all regions and to address gaps in knowledge, including by fostering relevant research.

6. The Plan of Action is aimed at facilitating the implementation of actions to safeguard and promote pollinators and pollination functions and services across agricultural landscapes and related ecosystems, including forests, grasslands, croplands, wetlands, savannas, coastal areas and urban environments. The activities can be applied at the regional, national, subnational and local levels.

II. CONTEXT AND OVERALL RATIONALE

7. Animal-mediated pollination is a regulating ecosystem service of vital importance for nature, agriculture, and human well-being. This service is provided by pollinators, namely by managed bees, wild bees, and other insects, such as flies, butterflies and beetles, as well as vertebrates, such as bats, birds and some primates. The assessment report on pollinators, pollination, and food production published by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)⁹ underscores the role of pollinators in multiple respects. Nearly 90 per cent of the world's wild flowering plant species depend, entirely or at least in part, on animal pollination. These plants are essential for the functioning of ecosystems by providing other species with food, habitats and other resources. In addition, some self-pollinating crops, such as soybean, can also benefit from enhanced productivity by animal pollinators.

8. Strong declines of some pollinator taxa over the last few decades have been observed, although data on the status and trends of wild pollinators is limited, and largely restricted to some regions of Europe and the Americas. Risk assessments of the status of wild insect pollinators, such as wild bees and butterflies, are similarly geographically restricted but indicate high threat levels, with proportions of threatened species often exceeding 40 per cent.

9. At the same time, as global agriculture has become increasingly pollinator-dependent, much of this dependence is linked to wild pollinators.¹⁰ Beyond marketable products and health benefits stemming from diverse and nutritious diets enabled by pollination, pollinators provide non-monetary benefits for human well-being as sources of inspiration for arts and crafts, religion, traditions or recreational activities.

10. Many of the main direct drivers of pollinator loss have remained the same as originally identified by the Convention on Biological Diversity in its first decision on pollinators:¹¹ habitat fragmentation and land use change, agricultural and industrial chemicals, parasites and diseases, and invasive alien species. In addition, the importance of other direct drivers, such as climate change, has emerged, and greater attention has been focused on drivers linked to intensive agricultural practices,

⁹ IPBES (2016). [Assessment Report on Pollinators, Pollination and Food Production](#).

¹⁰ Ibid.

¹¹ Decision VI/5 on agricultural biological diversity, annex II.

such as monoculture, and the use of pesticides, with increased evidence of both lethal and sublethal effects of pesticides on bees, and the understanding that the combination of different drivers can increase the overall pressure on pollinators.

11. In the broader context, pollinators can be considered an important link for agriculture, forestry, biodiversity, health, food security, food safety and nutrition. Pollinator-friendly measures have the potential to increase productivity and sustainability and contribute to the long-term viability and profitability of food production systems. Their wider use could be a transformative agent by fostering sustainable practices among agricultural sectors.

12. The first phase of the International Pollinators Initiative (2000-2017) facilitated the identification of main threats and the causes of pollinator decline, as well as the impacts of pollination functions and services and reductions on food production. In addition, taxonomic information on pollinators, the assessment of their economic value in various countries and crops were important steps not only to reinforce research and monitoring, but also to promote the conservation, restoration and sustainable use of pollinators. A number of relevant tools were developed, and many studies were carried out, including the IPBES assessment and complementary studies.

13. The essential role of pollinators in food production, and the importance of their diversity and abundance in agricultural landscapes and related ecosystems are now well recognized. The updated Plan of Action builds on the first phase, and taking into account decision XIII/15, orients the emphasis towards mainstreaming pollination concerns into policy, developing and implementing measures on the ground to support the conservation and sustainable use of pollinators, addressing risks, building capacity and sharing knowledge on multiple levels to integrate pollination considerations into farming, land use and other management decisions, and focusing collaborative research on emerging issues and prevailing needs.

III. ELEMENTS

Element 1: Enabling policies and strategies

Operational objective

To support the implementation of coherent and comprehensive policies for the conservation and sustainable use of pollinators at the local, subnational, national, regional and global levels, and to promote their integration into sectoral and cross-sectoral plans, programmes and strategies.

Rationale

Appropriate national policies are needed in order to provide an effective enabling environment to support activities by farmers, land managers, beekeepers, the private sector and civil society. Pollination concerns are often a cross-cutting issue, and policies should be designed to integrate pollinator and pollination considerations not only into the context of sustainable agricultural transitions, but also across sectors (for example forestry and health).

Activities

A1.1 Develop and implement coherent and comprehensive policies that enable and foster activities to safeguard and promote wild and managed pollinators, to be integrated into the broader policy agendas for sustainable development

A.1.1.1 Promote coherent policies across sectors and cross-cutting issues (e.g. biodiversity, food security, chemicals and pollution, poverty reduction, climate change, disaster risk reduction and combat desertification);

A.1.1.2 Address linkages between pollinators and human health, nutritious diets and pesticide exposure;

A.1.1.3 Address linkages between pollinators and the provision of ecosystem functions and services, beyond food production;

A.1.1.4 Recognize pollinators and pollination as part of holistic farming systems and as an important agricultural input;

A.1.1.5 Recognize pollinators and pollination as an essential part of the of ecosystem integrity and its maintenance;

A.1.1.6 Apply nature-based solutions and reinforce positive interactions (e.g. integrated pest management, on-farm diversification, ecological intensification, restoration to increase landscape connectivity);

A.1.1.7 Support access to data and use of decision support tools, including land use planning and zoning, to enhance the extent and connectivity of pollinator habitats¹² in the landscape, with the participation of farmers and local communities;

A.1.1.8 Support the development of capacity to provide guidance on pollinator and pollination best management practices by supporting the incorporation of nature-based solutions into extension services, farmer-to-farmer sharing, and farmer researcher networks;

A.1.1.9 Develop and implement incentives, consistent and in harmony with international obligations, for farmers and food suppliers to encourage the adoption of pollinator-friendly practices (e.g. carbon sequestration measures that increase pollinator habitats; conservation of uncultivated areas for pollinator forage) and remove or reduce perverse incentives that are harmful to pollinators and their habitats (e.g. pesticides subsidies; incentives for pesticide use as credit requirements from banks), taking into consideration the needs of farmers, urban and rural beekeepers, land managers, indigenous people and local communities and other stakeholders;

A.1.1.10 Promote recognition of pollinator-friendly practices and consequences on pollination functions and services in existing certification schemes;

A.1.1.11 Protect and conserve the threatened pollinator species as well as their natural environment.

A1.2 Implement effective pesticide regulation¹³

A.1.2.1 Reduce the use of and gradually phase out existing pesticides, including cosmetic pesticides and agricultural chemicals, that are harmful to or that present an unacceptable risk to pollinators, and avoid the registration of those that are harmful or present an unacceptable risk to pollinators;

A.1.2.2 Develop, enhance and implement on a regular basis risk assessment procedures (considering field-realistic exposures and longer-term effects) for pesticides, pesticide-coated seeds and living modified organisms to take into account possible impacts and cumulative effects, including sublethal and indirect effects, on wild and managed pollinators (including eggs, larva, pupa and adult stages), as well as other non-target species;

A.1.2.3 Work with regulators to implement tools such as the FAO Pesticide Registration Toolkit;

A.1.2.4 Strengthen pesticide regulation authorities in their capacity to protect pollinators from chemicals;

A.1.2.5 Develop and promote guidance and training on best practices for pesticide use (e.g. techniques, technology, timing, non-flowering crops, weather conditions) based on the International Code of Conduct on Pesticide Management of FAO and the World Health Organization;

A.1.2.6 Develop and implement national and regional pesticide risk reduction strategies and promote alternative approaches (e.g. integrated pest management practices and biocontrol) to reduce or eliminate exposure of pollinators to harmful pesticides;

A.1.2.7 Develop and implement, as appropriate, national monitoring, surveillance and registration programmes for pesticides and their transformation products.

¹² Pollinator habitats: areas that provide forage, nesting sites and other conditions for the completion of the life cycles of different pollinator species.

¹³ Taking note of the IUCN CEM/SSC Task Force on Systemic Pesticides publication “An update of the Worldwide Integrated Assessment (WIA) on systemic insecticides”.

A1.3 Protect and promote indigenous and traditional knowledge

A.1.3.1 Protect and promote indigenous and traditional knowledge, innovations and practices related to pollinators and pollination (e.g. hive design; stewardship of pollinator resources; traditional ways of understanding of parasite impacts) and support participatory approaches to the identification of diagnostic characteristics for new species and monitoring;

A.1.3.2 Protect established land rights and tenure for the conservation and sustainable use of pollinators.

A1.4 Control the trade and movement of managed pollinators, and other trade-related impacts

A.1.4.1 Monitor the movement and trade of managed pollinator species, sub-species and breeds among countries and within countries;

A.1.4.2 Develop and promote mechanisms to limit the spread of parasites and pathogens to managed and wild pollinator populations;

A.1.4.3 Prevent and minimize the risk of introducing and spreading invasive alien species (plants, pollinators, predators, pests and pathogens) that present an unacceptable risk to pollinators and to plant resources on which they depend, and monitor the dispersion risk of those already introduced (for example, *Bombus terrestris*).

Element 2: Field-level implementation

Operational objective

To reinforce and implement management practices that maintain healthy pollinator communities, and enable farmers, beekeepers, foresters, land managers and urban communities to harness the benefits of pollination functions and services for their productivity and livelihoods.

Rationale

In order to secure pollinator-friendly habitats and promote sustainable agroecosystems and pollinator husbandry, the direct and indirect drivers of pollinator decline need to be addressed in the field. Attention is needed at the farm level and across entire ecosystems. Landscape-level measures address connectivity and the value of managing across landscapes and sectors. Improved management measures for pollinators include attention to bee husbandry for honey bees and other pollinators.

Activities

A2.1 Co-design (with farmers, urban and rural beekeepers, land managers and indigenous peoples and local communities) and implement pollinator-friendly practices in farms and grasslands and in urban areas

A.2.1.1 Create uncultivated patches of vegetation and enhance floral diversity using mainly native species, as appropriate, and extended flowering periods, to ensure diverse, abundant and continuous floral resources for pollinators;

A.2.1.2 Manage blooming of mass-flowering crops to benefit pollinators;

A.2.1.3 Foster networks for exchanges of native seeds;

A.2.1.4 Promote genetic diversity and its conservation within populations of managed pollinators;

A.2.1.5 Promote extension services, farmer-to-farmer sharing approaches and farmer field schools to exchange knowledge and provide hands-on education and empowerment of local farming communities;

A.2.1.6 Diversify farming systems and the resulting food resources and habitats of pollinators through home gardens and agroecological approaches, such as crop rotations, intercropping, agroforestry, integrated pest management, organic agriculture, and ecological intensification;

A.2.1.7 Promote awareness, training and adoption of best practices for integrated pest management (for example, including weed management strategies and biocontrol) and, if necessary, pesticide usage in the context of on-farm pollinator management (for example, pesticide application timing, weather conditions, equipment calibration in order to reduce spray drift to off-field areas), and to avoid or

minimize any synergistic effects of pesticides with other drivers that have been proven to pose serious or irreversible harm to pollinators;

A.2.1.8 Promote best practices for climate-resilient agriculture with benefits for pollinators;

A.2.1.9 Incorporate pollinator-friendly practices in existing practices in the relevant sectors, including agriculture and food production certification schemes.

A.2.2 Address pollinator-friendly management and pollinator needs in forestry

A.2.2.1 Avoid or minimize deforestation, harmful forest management practices and other threats that impact negatively on wild pollinators and on traditional bee keeping;

A.2.2.2 Provide and promote measures to capture, safeguard and transport beehives found inside wooden logs;

A.2.2.3 Promote agroforestry and forestry systems to ensure heterogeneous habitats formed by native species, which offer diversified floral and nesting resources for pollinators;

A.2.2.4 Include considerations regarding pollinators in the rules for sustainable forest management certification systems.

A.2.3 Promote connectivity, conservation, management and restoration of pollinator habitats

A.2.3.1 Preserve or restore pollinators and habitats distributed in natural areas, including forests, grasslands and agricultural lands, urban areas and natural corridors, to enhance the availability of floral resources and nesting sites over time and space;

A.2.3.2 Identify priority areas and measures, on the global, regional, national and local levels for the conservation of rare and endangered pollinator species;

A.2.3.3 Foster the establishment and pollinator-friendly management of nature protection areas and semi-natural areas, as well as other in-site options, such as the FAO Globally Important Agricultural Heritage Systems;

A.2.3.4 Promote initiatives in urban areas and service land along roads and railways to create and maintain green areas and vacant lands that offer floral and nesting resources to pollinators, and improve the relationship between people and pollinators by raising public awareness of the importance of pollinators for their daily lives;

A.2.3.5 Manage the use of fire and fire control measures to reduce the negative impacts of fires on pollinators and relevant ecosystems.

A.2.4 Promote sustainable beekeeping and bee health

A.2.4.1 Reduce the dependence of managed pollinators on nectar and pollen substitutes by promoting better availability and husbandry of floral resources, therefore improving pollinator nutrition and immunity to pests and diseases;

A.2.4.2 Minimize the risks of infections and spread of pathogens, diseases and invasive alien species and minimize the stress on managed pollinators associated with the transportation of bee hives;

A.2.4.3 Regulate markets for managed pollinators;

A.2.4.4 Develop measures to conserve genetic diversity in managed pollinators;

A.2.4.5 Promote local and traditional knowledge related to innovative practices in management of honeybees, stingless bees and other managed pollinators.

Element 3: Civil society and private sector engagement

Operational objective

To promote education and awareness in the public and private sectors of the multiple values of pollinators and their habitats, improve the tools for decision-making, and implement practical actions to reduce and prevent pollinator decline.

Rationale

Global agriculture has become increasingly pollinator-dependent, and much of this dependence is linked to wild pollinators. The general public and the private sector, including the food and cosmetics industries and supply chain managers, are increasingly showing an interest in protecting pollinators. Building on this, targeted actions on conservation of pollinators and their habitats need to be elaborated for civil society and for the private sector. Greater understanding of the vulnerability to pollination services losses and the value of these functions and services will help to drive such initiatives.

Activities

A3.1 General public awareness-raising

A.3.1.1 Engage in awareness raising with targeted key stakeholder groups, including farmers, extension workers, beekeepers, non-governmental organizations, schools, the mass media, and consumer organizations on the value of pollinators and pollination for health, wellbeing and livelihoods;

A.3.1.2 Raise the awareness of the private sector, including food companies, cosmetics manufacturers and supply chain managers, of the risks posed by the decline of pollination functions and services to their business and the value of protecting pollinators;

A.3.1.3 Promote use of technology and build taxonomic capacity for the general public, including farmers and beekeepers, to identify and differentiate pollinators from pests, eventually contributing to data collection on pollinators;

A.3.1.4 Support campaigns and activities to engage stakeholders in the conservation and sustainable use of pollinators, including celebrations on 20 May of World Bee Day, which was established by the United Nations General Assembly.¹⁴

A3.2 General public actions

A.3.2.1 Promote educational activities with children and students on the importance of pollinators and ecosystem functions and services in their daily lives and propose ways to contribute to the protection of pollinators;

A.3.2.2 Integrate pollinators and ecosystem functions and services subjects into the curriculum of agriculture, environment and economics courses;

A.3.2.3 Support citizen science projects for generating data on pollinators and pollination and raising appreciation among civil society organizations for the role of pollinators;

A.3.2.4 Encourage network-building activities, including through conferences,¹⁵ dissemination of information on pollinators and pollination through public databases, web portals, social media and information networks that facilitate access to all relevant stakeholders.

A3.3 Business and supply chain engagement

A.3.3.1 Provide decision-making tools to assist different stakeholders in assigning values to pollinators and pollination, including non-monetary values;

A.3.3.2 Develop modalities to incorporate pollinators and pollination in true cost accounting of agriculture and food production;

A.3.3.3 Improve understanding within the private sector of the links between commercial products and the dependency of commodities (crop yields and quality) on respective type of pollinators;

¹⁴ See [General Assembly resolution 72/238](#) of 20 December 2017 on agriculture development, food security and nutrition.

¹⁵ For example, a regular conference for the initiative (possibly linked to the International Federation of Beekeepers Associations <http://www.apimondia.com/>).

A.3.3.4 Share evidence of pollination deficit and the economic impacts, and impacts on livelihoods, to support business in identifying potential risks, developing vulnerability assessments, and adopting pollinator-friendly measures;

A.3.3.5 Develop and share pollinator-friendly business cases for action;

A.3.3.6 Promote the use of ecolabels, standards and the importance of choices for consumers that may benefit pollinators.

Element 4: Monitoring, research and assessment

Operational objective

To monitor and assess the status and trends of pollinators, pollination and their habitats in all regions and to address gaps in knowledge, including by fostering relevant research.

Rationale

Monitoring and assessment of the status and trends of pollinators and pollination functions and services, of measures for the conservation and sustainable use of pollinators, and of the outcomes of such measures, is necessary to inform adaptive management. Academic and research bodies, and relevant international organizations and networks should be encouraged to undertake further research, taking into consideration traditional knowledge, to address gaps in knowledge and to expand research to cover a wider variety of pollinators and to support coordinated global, regional, national, subnational and local monitoring efforts and build relevant capacity, especially in developing countries, where there have been fewer research and monitoring efforts to date.

Activities

A4.1 Monitoring

A.4.1.1 Monitor the status and trends of pollinators, with particular focus on those regions currently lacking data;

A.4.1.2 Quantify pollination deficits in crops and in the natural ecosystems, with particular focus on those regions and farming systems currently lacking data, where feasible, and apply consistent and comparable protocols to identify the most effective intervention measures;

A.4.1.3 Monitor the drivers and threats to pollinators in tandem with their status and trends in order to identify the likely causes of pollinator declines;

A.4.1.4 Monitor the effectiveness of interventions in protecting pollinators and managing pollination functions and services;

A.4.1.5 Support the use of technology and the development of user-friendly tools, such as mobile apps, to promote pollinators monitoring through citizen science;

A.4.1.6 Promote the use of pollinators and pollination as indicators for the status of biodiversity, ecosystem health, agriculture productivity and sustainable development;

A.4.1.7 Promote the development of methodologies for systematic monitoring of pollinators in natural ecosystems, especially in protected areas or sites of importance for conservation and productive ecosystems in such a way as to facilitate the development of detailed visual maps at the local level and then subsequent decision-making.

A4.2 Research

A.4.2.1 Promote research on non-bee taxa and other wild species of pollinators in natural ecosystems and the ecosystem functions and services provided by them in order to design appropriate management policies and protection measures;

A.4.2.2 Undertake research, including participatory research, on the socioeconomic as well as environmental implications of pollinator decline in the agricultural sector and related businesses;

A.4.2.3 Facilitate the harmonization of protocols for research, data collection, management and analysis, storage and curation of pollinator samples, including modalities for collaborative research;

A.4.2.4 Promote and share further research to address gaps in knowledge, including the effects of partial loss of pollinators on crop production, the potential impacts of pesticides considering their possible cumulative effects, and of living modified organisms, under field conditions, including differential impacts on managed and wild pollinators, and on social versus solitary pollinators, and the impacts on pollination of crop and non-crop plants over the short and long term, and under different climatic conditions, as well as the impact of pollinator loss, on ecosystem integrity and its maintenance;

A.4.2.5 Promote further research to identify ways to integrate pollinator-friendly practices into farming systems as part of efforts to improve yield quantity and quality and mainstreaming of biodiversity into agricultural systems;

A.4.2.6 Promote further research to identify risks to pollination under climate change and potential adaptation measures and mitigation tools, including the potential loss of keystone species and their habitats, as well as the role of pollination in wider ecosystem resilience and restoration;

A.4.2.7 Promote further research and analysis on pest management as it interacts with pollination functions and services, taking into account the impact of drivers of pollinator decline, to support the development of more feasible and sustainable alternatives;

A.4.2.8 Promote further research and analysis to identify ways to integrate the provision of ecosystem functions and services and pollinator conservation, beyond food production;

A.4.2.9 Translate pollinator research and findings into recommendations and best practices tailored for a wide range of stakeholder groups;

A.4.2.10 Strengthen the synergies between scientific evidence, conservation practices and farmer-researcher community practices, and traditional knowledge to better support actions.

A4.3 Assessment

A.4.3.1 Generate data sets through a permanent pollinator monitoring process that allows the creation of regional/national/subnational and local visual maps to indicate the status and trends of pollinators and pollination and crop-specific vulnerability to support decision-making;

A.4.3.2 Assess the benefits of pollinators and pollination, taking into account the economic and other values to agriculture and the private sector, including food companies, cosmetics manufacturers and supply chains;

A.4.3.3 Assess the benefits of pollinator-friendly practices, including the conservation of uncultivated areas of farmlands, and propose alternatives to deforestation;

A.4.3.4 Increase understanding of the consequences of pollinator decline in specific crops, agroecosystems and natural environments;

A.4.3.5 Support the identification of pollinators in natural and managed areas, such as forestry and agricultural systems, as well as the interactions between pollinators and plants, and the impacts of anthropogenic activities in ecosystems;

A.4.3.6 Address taxonomic assessment needs in different regions and design targeted strategies to fill the existing gaps;

A.4.3.7 Increase taxonomic capacity to improve knowledge about pollinators, their status and trends, identify drivers of changes in their populations, and develop appropriate solutions;

A.4.3.8 Promote regular assessments of the conservation status of pollinator species from different taxonomic groups, update national, regional and global red data books and red lists regularly and elaborate plans of action for the conservation and restoration of threatened pollinator species.

Actors

This Plan of Action is addressed to all relevant stakeholders, including Parties to the Rio Conventions and other multilateral environmental agreements, national, subnational and municipal governments, donor agencies, including the Global Environment Facility, the World Bank and regional and national development banks and banks with a significant portfolio of loans for rural development, private and

corporate donors, as well as other relevant bodies and organizations, land owners and land managers, farmers, beekeepers, indigenous peoples and local communities, the private sector and civil society.

FAO will facilitate the implementation of the Plan of Action, following the successful approach of the previous plan. This new phase is also intended to align the activities on pollination and pollinators more closely with FAO regional and country offices in order to create synergies and provide broader support. The full implementation of the second phase of the Plan of Action at the national and regional levels will depend on the availability of resources.

IV. SUPPORTING GUIDANCE AND TOOLS

A list of supporting guidance and tools is provided in an information note (CBD/SBSTTA/22/INF/20).

Annex II

SUMMARY - REVIEW OF THE RELEVANCE OF POLLINATORS AND POLLINATION TO THE CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY IN ALL ECOSYSTEMS, BEYOND THEIR ROLE IN AGRICULTURE AND FOOD PRODUCTION

A. Introduction

1. The full report¹⁶ and the present summary have been prepared pursuant to decision [XIII/15](#). The report draws on the contributions of many researchers and partners around the world.¹⁷

B. Roles and values of pollinators and pollinator dependent plants beyond agriculture

2. There is a wide diversity of values linked to pollinators and pollination beyond agriculture and food production, which includes ecological, cultural, financial, health, human and social values.

3. Pollinators enhance the reproduction and genetic diversity of the great majority (c. 87.5%) of plant species. About half of plant species are completely dependent on animal-mediated pollination. Animal-mediated pollination usually leads to some degree of cross-pollination and thus promotes and maintains genetic variation in populations, which, in turn, allows plant species to adapt to new and changing environments. Cross-pollination also results in higher seed production. By ensuring a supply of seed propagules and promoting genetic variation, pollinators are considered to be of fundamental importance for the maintenance of plant diversity and ecosystem functioning.

4. Plants and pollinators are critical for the continued functioning of ecosystems, contributing to climate regulation, provision of wild meat, fruits and seeds that support many other species, regulation of malaria and other diseases, among other functions and services. Tropical forests, which contain a high proportion of dioecious species, are particularly dependent on pollination. Another example is mangroves, dominated by obligate outbreeder plants, which provide important functions and services, such as preventing coastal erosion, protecting from flood and salt intrusion, providing wood fuel and timber, and supporting fisheries, as well as habitat and food provision for bees and many other species.

5. The mutualisms between plants and their floral visitors sustain not only plant diversity but also the diversity of an estimated 350,000 animal species. While there is strong evidence of local extirpation of pollinator populations due to a lack of floral resources, there is no report on animal species extinction due to a lack of floral resources. However, given the extent of habitat fragmentation, the large number of plant species that have become extinct or nearly so in the past 100 years and the paucity of knowledge about host plant usage by flower-visiting animals, the possibility that this is occurring without being

¹⁶ Review of pollinators and pollination relevant to the conservation and sustainable use of biodiversity in all ecosystems, beyond their role in agriculture and food production (CBD/COP/14/INF/8).

¹⁷ The main authors of the report are Marcelo Aizen, Pathiba Basu, Damayanti Buchori, Lynn Dicks, Vera Lucia Imperatriz Fonseca, Leonardo Galetto, Lucas Garibaldi, Brad Howlett, Stephen Johnson, Monica Kobayashi, Michael Lattorff, Phil Lyver, Hien Ngo, Simon Potts, Deepa Senapathi, Colleen Seymour and Adam Vanbergen. The report was edited by Barbara Gemmill-Herren and Monica Kobayashi. A workshop convened from 27 to 29 November 2017 in collaboration with IPBES, the University of Reading, and the Convention on Biological Diversity brought together regional experts on pollinators to discuss and assess the role of pollinators and pollination services in supporting ecosystems beyond agricultural systems and in supporting ecosystem services beyond food production.

documented is very real. Data on population changes in wild flower-visiting animals are notoriously difficult to obtain and the causes of these changes even more difficult to establish.

6. Pollinators, pollinator habitats and pollinator products are sources of inspiration for art, education, literature, music, religion, traditions and technology. Honey-hunting and beekeeping practices based on indigenous and traditional knowledge have been documented in more than 50 countries. Bees have inspired imagery and texts in religions all over the world, and other pollinators, such as hummingbirds, contribute to the national identity of such countries as Jamaica and Singapore. Pollinators and pollinator-dependent plants support advances in technology and knowledge through inspiration and application of their biology to human innovations, such as the visually guided flight of robots.

7. Bee products contribute to the income of beekeepers around the globe. Beekeeping can potentially be an effective tool for reducing poverty, empowering youth and creating opportunities to the conservation of biodiversity by adopting bee-friendly actions.

8. There is a range of economically important plants outside crops that depend on animal pollinators, which include several medicinal plant species. Other pollinator-dependent plants can provide valuable functions and services, such as ornamentals, biofuels, fibres, construction materials, musical instruments, arts, crafts and recreation activities. Pollinator-dependent plants also recycle CO₂, regulate climate, and improve air and water quality. Furthermore, several micronutrients, including vitamins A and C, calcium, fluoride and folic acid are obtained primarily from pollinator-dependent plants. Additionally, pollinator products are employed for improving health, such as antibacterial, anti-fungal and anti-diabetic agents. Pollinator insects, including the larvae of bees, beetles and palm weevils, constitute a significant proportion of the approximately 2,000 insect species consumed globally, being high in protein, vitamins, and minerals.

C. Status and trends of pollinators and pollinator-dependent plants in all ecosystems

9. Many insect pollinators (e.g. wild bees, butterflies, wasps and beetles) as well as vertebrate pollinators (e.g. birds, marsupial, rodents and bats) have been declining in abundance, occurrence and diversity at the local and regional levels. The number of plant species that rely on pollinators is declining when compared to self-compatible or wind-pollinated plants.

10. For all regions, land use change is reported as the main driver of pollinator decline. In Africa, deforestation continues to occur as a result of the conversion of land for agriculture and the use of timber for construction and fuel. In Latin America and Asia and the Pacific, increasing soybean cultivation and oil palm plantations respectively has impacted many important biomes.

11. Wild bee nests in nature are in danger of depletion as a result of logging practices. In Malaysia and Brazil, it has been shown that logging reduces the number of wild bee nests and, as a consequence, pollinators, which has implications for forest recovery or restoration. Logging also reduces the forest habitat that contains suitable, unoccupied nesting sites. The loss of pollinators occurs even if the current rules for certified wood management are taken into account.

12. Additionally, in Africa, the frequency and intensity of fires, which, in turn, affect the reseeded and re-sprouting of plants, affect different ecosystems due to a high degree of pollinator-plant specialization. Such specialization suggests a marked susceptibility to pollinator loss, and reliance on a single species of pollinator is potentially risky in the face of global changes. Climate change models suggest that fires might increase in frequency, as the length of the fire weather season will increase.

13. In Latin America, alien bee invasions are reported as the second driver of local bee decline. Introduced bee species are also a concern, for instance, in Japan, where there is a potential for disruption of the native pollination network. In Asia, the erosion of traditional knowledge, including the management of local bees, may contribute to local pollinator declines. For Europe, Canada and the United States, Australia and New Zealand, the risk to pollinators from pesticides and the transmission of pathogens and parasites is an important concern.

14. A lack of spatial and temporal changes in wild pollinators in many regions, combined with little known taxonomy, hampers assessment of the status and trends of pollinators. In addition, a lack of global Red List assessments specifically for insect pollinators and, in most parts of the world, the lack of long-

term population data or benchmark data to compare the present status of wild pollinator populations make it difficult to discern any temporal trend.

15. The habitats and biomes identified as most vulnerable to pollinator declines per region are:

(a) *Africa*: Tropical forest, dry deciduous forest, subtropical forest, Mediterranean, mountain grasslands, tropical and subtropical savannas and grasslands, drylands and deserts, wetlands and dambos, urban and peri-urban, coastal areas;

(b) *Asia and the Pacific*: Tropical dry evergreen forests;

(c) *Latin America*: Andes, Mesoamerican Mountains and regions of high altitude, the subtropical Chaco forest, the Cerrado savannah, the Pantanal wetland, the Amazonian forest, the Atlantic Forest, among others;

(d) *Europe, Canada, the United States, Australia and New Zealand*: mires and bogs, grasslands, heathland, and scrub.

16. The Atlantic forest is a biome rich in plant-pollinator mutualisms which, with only 29 per cent of its original forest cover,¹⁸ is highly threatened through habitat loss and fragmentation. The extreme fragmentation of this biome has implied a differential loss of plant species with relatively specialized pollination and sexual systems that only survive in the interior of large remnants. In the Chaco Dry Forest, it has been suggested that an increase in selfing (self-pollination) could be associated with the invasion of Africanized honey bees.

17. Climate change is considered a significant potential threat in Europe and North America. Bumble bees are failing to track warming by colonizing new habitats north of their historic range. Simultaneously, they are disappearing from the southern portions of their range. Some species have declined severely.

18. Meliponiculture – beekeeping with stingless bees (Meliponini) – is widely undertaken by indigenous peoples and local communities with knowledge passed orally through generations. Stingless bees are useful pollinators for crops and wild fruits, and most of them produce honey, which is used for medicinal purposes. While meliponiculture is an economic opportunity for tropical countries, the large-scale rearing of stingless bees is considered a current challenge.

19. The introduction of honeybee (*Apis*) species in mangroves has been explored in many countries, such as China, Cuba, India and the United States, and is also increasing in Thailand and Brazil. This activity may have the potential to contribute to the conservation of the mangrove systems, but the impacts need to be further assessed. Management of colonies, including artificial reproduction and queen rearing, needs to be advanced in order to use natural resources in a sustainable way.

20. Regarding the impact of pesticides on non-target species, a recent meta-analysis showed that, when compared to honeybees, stingless bees are more sensitive to various pesticides. Experimental studies performed with other pollinators, such as the great fruit-eating bat (*Artibeus lituratus*) from Brazil, indicate that the chronic exposure of fruit bats to relevant concentrations of endosulfan can lead to significant bioaccumulation, which may affect the health of this important seed disperser in neotropical forests. Similarly, analysis of long-term butterfly population data from Northern California revealed a negative association between butterfly populations and increasing neonicotinoid application. A controlled landscape experiment implemented across three countries (Hungary, Germany and the United Kingdom) that employed oilseed rape (canola) treated with neonicotinoids (clothianidin or thiamethoxam) showed that wild bee reproduction (*B. terrestris* and *Osmia bicornis*) was negatively correlated with neonicotinoid residues in the bee nests.

21. Living modified organisms that may affect non-target organisms should be subject to case-by-case risk assessment with regard to bees as well as domesticated and wild pollinators considering the species of living modified organism and the receiving environment. Risk assessment should consider different developmental stages and the potential of both lethal as well as sublethal effects, among other relevant aspects. Recent reviews show no direct negative effects of living modified organisms on honeybees as well as domesticated and wild pollinators; nevertheless, further scientific research on the

¹⁸ Official data: http://www.mma.gov.br/biomas/mata-atl%C3%A2ntica_emdesenvolvimento

above-mentioned aspects of the potential effects of living modified organisms on pollinators are of interest.

22. Latin America hosts the wild germplasm of many food crops¹⁹ that directly or indirectly depend on pollinators for high yield. Germplasm of these, and perhaps of hundreds of wild species with agricultural potential, persists in remnants of natural and seminatural habitats and under the management of local indigenous communities in this region. Therefore, diverse pollinator assemblages are important to ensure not only the reproduction of wild plants in general but also the persistence of this germplasm. Yet, perhaps with a few exceptions, the occurrence and diversity of this germplasm and its current conservation status are unknown.

D. Response options for the conservation and sustainable use of pollinators and their habitats

23. Many of the activities identified in the IPBES assessment and reflected in decision XIII/15, will contribute to the conservation and sustainable use of pollinators and their habitats and thereby help to sustain pollination functions in ecosystems beyond agricultural systems and food production.

24. A landscape-wide approach is particularly relevant for the conservation and sustainable use of pollinators and their habitats to sustain pollination functions in ecosystems beyond agricultural systems and food production. This includes the maintenance of natural vegetation corridors, restoration of degraded lands, and the use of pollination-friendly farming. Special attention is needed to reduce deforestation and habitat loss and degradation in all biomes. Fire management regimes should take into account impacts on pollinators and related vegetation. Restoration can increase the connectivity of pollinator-friendly habitats and support species dispersal and gene flow. These measures can also contribute to climate change adaptation and mitigation and disaster risk reduction.

25. The following actions could be taken in support of a landscape approach:

(a) Areas managed by indigenous peoples and local communities are important for the conservation of biodiversity;

(b) Significant land use changes are related to deforestation caused by crops. Raising the awareness of the buyers of those commodities can increase pressure for attaining sustainable production;

(c) Data collection, maps and modelling are important tools to predict the impact of global change and to support policies for the conservation, restoration and regeneration of natural habitats;

(d) Landscape genetics is a tool to determine population characteristics of pollinators, as well as the genetic consequences of bee management in large areas, inside or outside their distribution areas.

26. There is an urgent need to set up and harmonize regulations for the trade in managed pollinators (best management practices, risk management and monitoring to prevent risks, harmonized reporting procedure, data management strategy) so that current and emerging risks and threats can be detected in near-real time and across borders, allowing for response measures.

27. Sustainable wood management and certification rules should take into account measures such as the capture, transportation and safeguard of beehives found in forestry products.

28. There is a need to improve knowledge of pollinators and pollination and their role in maintaining ecosystem health and integrity beyond agriculture and food production. The majority of existing literature focuses on specific hymenopteran groups. There is a lack of information on the impact of landscape changes or pesticides on non-bee taxa.

29. The following actions could be taken in support of improving knowledge:

(a) Improved knowledge management, including through taxonomy, volunteer recording, DNA barcoding, biodiversity informatics tools, geographical referencing for the museum specimens, standardized long-term monitoring of pollinators and pollination functions and services;

¹⁹ These crops include potato, tomato, squashes, pumpkins, beans, pepper, cacao, strawberry, quinoa, amaranto, avocado, sweet potato, acai, palmito, Brazil nut, guarana, passion fruit and yucca.

(b) Attention to traditional and experiential knowledge, noting that conventional knowledge synthesis methods are not necessarily appropriate for synthesizing other forms of knowledge, such as indigenous and local knowledge or tacit knowledge held by practitioners, such as land managers and conservationists.

*Appendix II***Decision NP-3/14. Specialized international access and benefit sharing instruments in the context of Article 4, paragraph 4, of the Nagoya Protocol**

The Conference of the Parties serving as the meeting of the Parties to the Nagoya Protocol on Access and Benefit-sharing,

Recognizing the need to strengthen coordination and mutual supportiveness among international instruments on access and benefit-sharing,

Acknowledging that any criteria to identify a specialized international access and benefit-sharing instrument and any process for recognition of such an instrument is not intended to create a hierarchy between the Nagoya Protocol and other international instruments,

1. *Takes note* of the study²⁰ and potential criteria for specialized international access and benefit-sharing instruments in the context of Article 4, paragraph 4, of the Nagoya Protocol as summarized in the annex below, and *agrees* to reconsider these potential criteria at its fourth meeting;

2. *Invites* Parties and other Governments to submit:

(a) Information on how specialized international access and benefit-sharing instruments are addressed in their domestic measures;

(b) Views on the potential criteria contained in the study, taking into account Article 4, paragraphs 1 to 3, of the Protocol;

3. *Requests* the Executive Secretary to continue to follow developments in relevant international forums;

4. *Also requests* the Executive Secretary to synthesize the information and views submitted, including the information from developments in relevant international forums, and make it available for consideration by the Subsidiary Body on Implementation at its third meeting;

5. *Requests* the Subsidiary Body on Implementation at its third meeting to consider the synthesis referred to in paragraph 4 above and to make a recommendation to the Conference of the Parties serving as the meeting of the Parties to the Nagoya Protocol at its fourth meeting;

6. *Decides* to include a standing item on “cooperation with other international organizations” on the agenda of its future meetings to take stock of developments in relevant international forums, including any information on specialized international access and benefit-sharing instruments recognized by another intergovernmental body and/or by a Party or group of Parties, with a view to enhancing mutual supportiveness between the Protocol and specialized international access and benefit-sharing instruments;

7. *Invites* Parties and other Governments to coordinate at the national level regarding access and benefit-sharing issues addressed in different international forums, as appropriate, in order to support a coherent international regime on access and benefit-sharing;

8. *Invites* Parties and other Governments which are or may become Parties to the Nagoya Protocol and to a specialized international access and benefit-sharing instrument, as appropriate, to take steps to implement both instruments in a mutually supportive manner, including with the participation of indigenous peoples and local communities, where relevant or applicable, according to their national circumstances.

²⁰ “Study into criteria to identify a specialized international access and benefit-sharing instrument, and a possible process for its recognition” (CBD/SBI/2/INF/17).

*Annex***Potential criteria for specialized international access and benefit-sharing instruments in the context of Article 4, paragraph 4, of the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization**

The following is a summary of the potential criteria for specialized international access and benefit-sharing instruments in the context of Article 4, paragraph 4, of the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization, as described in the study contained in document CBD/SBI/2/INF/17. The potential criteria are under discussion and have not been agreed by Parties to the Protocol.

1. *Intergovernmentally agreed* — The instrument would be developed and agreed through an intergovernmental process. The instrument may be binding or non-binding.
 2. *Specialized* — The instrument would:
 - (a) Apply to a specific set of genetic resources and/or traditional knowledge associated with genetic resources which would otherwise fall under the scope of the Nagoya Protocol;
 - (b) Apply to specific uses of genetic resources and/or traditional knowledge associated with genetic resources which require a differentiated and hence specialized approach.
 3. *Mutually supportive* — The instrument would be consistent with and supportive of, and not run counter to the objectives of the Convention on Biological Diversity and the Nagoya Protocol, including with respect to:
 - (a) Consistency with biodiversity conservation and sustainable use objectives;
 - (b) Fairness and equity in the sharing of benefits;
 - (c) Legal certainty with respect to access to genetic resources or traditional knowledge associated with genetic resources and to benefit-sharing;
 - (d) Contribution to sustainable development, as reflected in internationally agreed goals;
 - (e) Other general principles of law, including good faith, effectiveness and legitimate expectations.
1. on Biological Diversity (CBD), which took place in Sharm-el-Sheikh, Egypt in November 2018.