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# COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

## Item 12.2 of the Provisional Agenda

### Seventeenth Regular Session

Rome, 18–22 February 2019

## PROGRESS REPORT ON THE IMPLEMENTATION OF THE INTERNATIONAL INITIATIVE FOR THE CONSERVATION AND SUSTAINABLE USE OF POLLINATORS

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CGRFA 17

## I. INTRODUCTION

1. The International Initiative for the Conservation and Sustainable Use of Pollinators (International Initiative for Pollinators) was formally established in 2000, as a cross-cutting initiative within the Convention on Biological Diversity's programme of work on agricultural biodiversity to promote the conservation, restoration and sustainable use of pollinator diversity in agriculture and related ecosystems, including by monitoring pollinator decline, addressing the lack of taxonomic information and assessing the economic value of pollination.<sup>1</sup> FAO has been the lead partner of the initiative and the Commission on Genetic Resources for Food and Agriculture (the Commission) received information on pertinent activities at its Fourteenth and Sixteenth Regular Sessions.<sup>2</sup>
2. This document describes progress made in the International Initiative for Pollinators since the Commission's Sixteenth Regular Session.

## II. FAO ACTIVITIES TO PROMOTE THE CONSERVATION AND SUSTAINABLE USE OF POLLINATORS

3. In the context of FAO's Global Action on Pollination Services for Sustainable Agriculture (Global Action), several national and regional pollinator initiatives have been developed and implemented. In some cases, these were implemented with the involvement of both environmental and agricultural ministries.
4. From October 2015 to July 2017, FAO supported a regional project in Latin America, entitled *Management Plan of the Environmental Pollination Service for the Sustainable Development of Production and Strengthening of Food Security*. The project aimed to collect and disseminate information on the status and agricultural importance of pollinator populations and to contribute to the promotion of sustainable practices for their preservation, restoration, mitigation and conservation at policy and production levels. In the framework of this project, FAO established and is currently implementing the Regional Platform on Pollination Service for Sustainable Agriculture.
5. Since 2010, FAO has been hosting the TECA<sup>3</sup> Beekeeping Exchange Group, a thematic discussion group on beekeeping created in collaboration with the International Federation of Beekeepers' Associations (APIMONDIA) in response to increasing demand for a central and reliable collection point for validated beekeeping techniques and technologies. TECA has a rich database with information on over 100 practices and technologies that relate to and can benefit pollinators, such as integrated pest management, agroforestry, related pollinator-friendly practices, production of bees and beekeeping.
6. FAO supported the Government of Slovenia's proposal to launch a *World Bee Day*. Having such a day represents a good opportunity to raise awareness on both the importance of bees and other pollinators to food security and nutrition, and the threats they face as a result of climate and land-use change, intensive agriculture, pesticide use and environmental pollution. During the *World Bee Day* celebrations in Slovenia on 20 May 2018, an International Ministerial Conference was organized to discuss both the main issues that are affecting the beekeeping sector, and possible actions to address them. The main outcome of the conference, which was attended by 21 countries covering all regions, was a set of resolutions that are now being acted upon. In addition to the event in Slovenia, other FAO events were conducted at the regional level for awareness raising on the importance of pollinators.
7. FAO and the Secretariat of the *Coalition of the Willing on Pollinators*<sup>4</sup> have been collaborating to synergize their work on the conservation of pollinators. During the 14<sup>th</sup> Meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD COP 14), the two

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<sup>1</sup> COP 5 Decision V/5.

<sup>2</sup> CGRFA-14/13/19 and CGRFA-16/17/Inf.22.

<sup>3</sup> TECA – Technologies and practices for small agricultural producers, is the FAO online platform for the exchange of agricultural knowledge and information for smallholder farmers.

<http://teca.fao.org/group/beekeeping-exchange-group>

<sup>4</sup> <https://promotepollinators.org/>

organizations also jointly organized a panel discussion on the power of pollinators to transform agricultural systems.<sup>5</sup>

8. At its Sixteenth Regular Session, held in January 2017, the Commission requested FAO to consider including domesticated honey bees, and potentially other pollinators, in its Domestic Animal Diversity Information System (DAD-IS).<sup>6</sup> In this context, FAO Member countries were invited, through a survey, to provide information on the status, trends and management of pollinator species. The results of this survey were presented at the Tenth Session of the Intergovernmental Technical Working Group on Animal Genetic Resources for Food and Agriculture in June 2018.<sup>7</sup>

*Development of the updated plan of action 2018-2030 for the International Initiative on the Conservation and Sustainable Use of Pollinators*

9. In November 2017, FAO hosted an expert meeting as part of a process<sup>8</sup> that resulted in *The Plan of Action 2018–2030 for the International Initiative for the Conservation and Sustainable Use of Pollinators*<sup>9</sup> that was adopted a year later by CBD COP 14.<sup>10</sup> The Plan of Action is provided in *Annex I* of this document.

10. In Decision 14/6 of COP 14, the CBD invited FAO to facilitate the implementation of the Plan of Action.<sup>11</sup> It also requested its Executive Secretary, subject to the availability of resources, and in collaboration with FAO, 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.<sup>12</sup>

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<sup>5</sup> <http://enb.iisd.org/biodiv/cop14/riopavilion/25nov.html>

<sup>6</sup> [CGRFA-16/17/Report/Rev.1](#), paragraph 46.

<sup>7</sup> CGRFA/WG-AnGR-10/18/Inf.7 and CBD/SBSTTA/22/INF/16.

<sup>8</sup> Taking into account submissions received in response to notifications (2017-030 and 2017-055); the *IPBES assessment report on Pollinators, Pollination, and Food Production*; the workshop organized by FAO; the UNEP-WCMC report on *The pollination deficit—Towards Supply Chain Resilience in the Face of Pollinator Decline*; other available information; and noting lessons learned from the first phase of the Plan of Action on the International Pollination Initiative (2000–2017). An earlier draft of the Plan of Action was made available for peer review from 5–26 March 2018. Peer review comments received from Japan, Peru, Benin, ICARDA and the Instituto de Investigaciones de la Amazonía Peruana have been taken into account in finalizing the draft.

<sup>9</sup> CBD/SBSTTA/22/10, Annex 1.

<sup>10</sup> CBD COP 14 Decision XIV/6.

<sup>11</sup> CBD/COP/DEC/14/6, paragraph 9.

<sup>12</sup> CBD/COP/DEC/14/6, paragraph 10.

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*ANNEX I*

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

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**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.
2. 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)<sup>13</sup> 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.<sup>14</sup> 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:<sup>15</sup> 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, 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,

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<sup>13</sup> IPBES (2016). [Assessment Report on Pollinators, Pollination and Food Production](#).

<sup>14</sup> Ibid.

<sup>15</sup> Decision VI/5 on agricultural biological diversity, annex II.

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*

#### **A.1.1 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 habitats<sup>16</sup> 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),

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<sup>16</sup> Pollinator habitats: areas that provide forage, nesting sites and other conditions for the completion of the life cycles of different pollinator species.

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 regulation<sup>17</sup>**

**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.

### **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*).

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<sup>17</sup> Taking note of the IUCN CEM/SSC Task Force on Systemic Pesticides publication “An update of the Worldwide Integrated Assessment (WIA) on systemic insecticides”.

## **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*

#### **A.2.1 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.



### **A2.3 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.

### **A2.4 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.<sup>18</sup>

### **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,<sup>19</sup> 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;

**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.

<sup>18</sup> See [General Assembly resolution 72/238](#) of 20 December 2017 on agriculture development, food security and nutrition.

<sup>19</sup> For example, a regular conference for the initiative (possibly linked to the International Federation of Beekeepers Associations <http://www.apimondia.com/>).

### *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)