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منظمة  
الغذية والزراعة  
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# COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

## Item 8 of the Provisional Agenda

### INTERGOVERNMENTAL TECHNICAL WORKING GROUP ON ANIMAL GENETIC RESOURCES FOR FOOD AND AGRICULTURE

#### Eleventh Session

19 - 21 May 2021

#### FAO ACTIVITIES ON CLIMATE CHANGE

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## I. INTRODUCTION

1. The Commission on Genetic Resources for Food and Agriculture (Commission), at its Seventeenth Regular Session, noted that its work on climate change should be integrated into the FAO Strategy on Climate Change and complementary to the work of other international organizations, and that it should be brought to the attention of the United Nations Framework Convention on Climate Change (UNFCCC) and other relevant instruments and organizations.<sup>1</sup>

2. Adaptation to and mitigation of climate change in the agricultural sectors require bold actions within the next decade. The UNFCCC's Koronivia Joint Work on Agriculture (KJWA)<sup>2</sup> takes into consideration the vulnerabilities of agriculture to climate change and approaches to addressing food security. Elements included in the work so far are:

- modalities for implementation of the outcomes of the five in-session workshops on issues related to agriculture and other future topics that may arise from this work;
- methods and approaches for assessing adaptation, adaptation co-benefits and resilience;
- improved soil carbon, soil health and soil fertility, under grassland and cropland as well as integrated systems, including water management;
- improved nutrient use and manure management towards sustainable and resilient agricultural systems;
- improved livestock management systems, including agro-pastoral production systems and others;<sup>3</sup> and
- socio-economic and food security dimensions of climate change in the agricultural sector.

3. The following two elements were added at the Fiftieth Session of the UNFCCC Subsidiary Bodies for discussion during an intersessional workshop planned for 2021:<sup>4</sup>

- sustainable land and water management, including integrated watershed management strategies, to ensure food security; and
- strategies and modalities to scale up implementation of best practices, innovations and technologies that increase resilience and sustainable production in agricultural systems according to national circumstances.

4. This document provides an overview of selected FAO activities related to biodiversity and climate change under the FAO Strategy on Climate Change. It can be noted that most activities are at the species and ecosystem levels rather than the genetic resources level.

## II. ACTIVITIES UNDER THE FAO STRATEGY ON CLIMATE CHANGE

5. Since the restructuring of FAO in 2020, the Office of Climate Change, Biodiversity and Environment<sup>5</sup> has brought together work on the Rio Conventions and the organization-wide facilitation of the implementation of the FAO Strategy on Climate Change, adopted in 2017,<sup>6</sup> and the FAO Strategy on Mainstreaming Biodiversity across Agricultural Sectors,<sup>7</sup> adopted in 2019.<sup>8</sup>

6. FAO's work on climate change adaptation and mitigation in the agriculture sectors is guided by the FAO Strategy on Climate Change and its three outcomes, as detailed below. A full report on the implementation of the Strategy is available in Annex 4 of FAO's *Programme Implementation Report*

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<sup>1</sup> CGRFA-17/19/Report, paragraph 31.

<sup>2</sup> UNFCCC Decision 4/CP.23

<sup>3</sup> As inserted at the May 2018 Subsidiary Bodies session when adopting the Road Map: document FCCC/SB/2018/L.1.

<sup>4</sup> FCCC/SB/2019/L.2.

<sup>5</sup> CL 164/3.

<sup>6</sup> CL 158/5, paragraph 5; CL 158/REP, paragraph 11.

<sup>7</sup> CL 163/11 Rev.1.

<sup>8</sup> CL 163/REP, paragraph 10 g.

2018–19.<sup>9</sup> These activities are implemented within broader frameworks such as climate-smart agriculture (CSA),<sup>10</sup> disaster risk reduction<sup>11</sup> and biodiversity mainstreaming.

### **Outcome 1. Enhanced capacities of Member Nations on climate change through FAO leadership as a provider of technical knowledge and expertise**

*Directly support Nationally Determined Contributions implementation in the food and agricultural sectors in countries through policy processes, capacity-development and technical interventions on the ground.*

7. The landscape of climate planning instruments available to countries under the UNFCCC process include National Adaptation Plans (NAPs), which focus on adaptation, Nationally Determined Contributions (NDCs), which focus on mitigation but include adaptation, and Long-term Strategies (LTS), which detail long-term low greenhouse-gas emission development strategies. FAO supports its Members in the design and implementation of NAPs, NDCs and sectoral strategies.<sup>12</sup>

8. Linking the NAP process with possible future iterations of NDCs has been identified as a possible means of supporting the identification of adaptation–mitigation co-benefits.<sup>13</sup> Over 90 percent of developing countries' NDCs refer to agriculture and land use as a major priority for mitigation and/or adaptation<sup>14</sup> and 52 percent of all NDCs include specific plant, animal or aquatic genetic resources conservation or management measures in agriculture as an adaptation priority.<sup>15</sup> FAO has analysed how GRFA and biodiversity figure in countries' adaptation and mitigation contributions in NDCs in Southern and Eastern Europe and Central Asia,<sup>16</sup> Asia<sup>17</sup> the Pacific,<sup>18</sup> Latin America<sup>19</sup> and the Caribbean.<sup>20</sup>

9. Through the German-funded EUR 15 million programme Integrating Agriculture in National Adaptation Plans (NAP-Ag), FAO, together with the United Nations Development Programme (UNDP), supports countries in the identification of climate adaptation measures and their integration into national planning and budgeting processes in support of efforts to achieve the Sustainable Development Goals and the Paris Agreement. Between 2015 and 2020,<sup>21</sup> this programme promoted the Voluntary Guidelines to Support the Integration of Genetic Diversity into National Climate Change Adaptation Planning,<sup>22</sup> adopted by the Commission in 2015, in the UNFCCC work streams.

10. Since 2017, FAO has been facilitating the Thematic Working Group (TWG) on Agriculture, Food Security and Land Use under the NDC Partnership. The TWG is a country-led peer-to-peer network through which countries and international organizations can consult one another, and share experiences and challenges related to climate change impacts and the implementation of NDCs in the agriculture sectors. The third workshop of the TWG, held in 2019, identified genetic diversity as an important topic for its food security theme.

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<sup>9</sup> <http://www.fao.org/3/nc390en/nc390en.pdf>

<sup>10</sup> <http://www.fao.org/3/CA2386EN/ca2386en.pdf>

<sup>11</sup> <http://www.fao.org/3/ca4417en/ca4417en.pdf>

<sup>12</sup> <http://www.fao.org/climate-change/programmes-and-projects/en/> and <http://www.fao.org/climate-change/programmes-and-projects/en/>

<sup>13</sup> <https://www.adaptationcommunity.net/nap-ndc/>

<sup>14</sup> <http://www.fao.org/3/a-i5687e.pdf>

<sup>15</sup> FAO Internal Database on Nationally Determined Contributions (NDCs) in the agriculture and land use sectors based on FAO methodology: <http://www.fao.org/3/cb1589en/cb1589en.pdf>

<sup>16</sup> <http://www.fao.org/3/CA3141EN/ca3141en.pdf>

<sup>17</sup> <http://www.fao.org/3/ca7264en/ca7264en.pdf>

<sup>18</sup> <http://www.fao.org/3/ca8681en/CA8681EN.pdf>

<sup>19</sup> <http://www.fao.org/3/ca8249en/CA8249EN.pdf>

<sup>20</sup> <http://www.fao.org/3/ca8672en/CA8672EN.pdf>

<sup>21</sup> <http://www.fao.org/in-action/naps/en/>

<sup>22</sup> <http://www.fao.org/3/a-i4940e.pdf>

11. In December 2020, on the occasion of the five-year anniversary of the Paris Agreement, FAO launched the FAO Climate Knowledge Hub,<sup>23</sup> which aims to provide comprehensive resources for the mobilization of ambition and actions in the agriculture and land sectors to address to climate change, including in relation to the management of genetic resources and biodiversity.
12. The publication *Addressing agriculture, forestry and fisheries in National Adaptation Plans – Supplementary guidelines*<sup>24</sup> targets national planners and decision-makers, experts and other stakeholders working on climate change adaptation and NAPs. The guidelines build upon lessons learned in countries and through the Integrating Agriculture in National Adaptation Plans (NAP-Ag) programme.<sup>25</sup> They are complemented by the publication on *Addressing forestry and agroforestry in National Adaptation Plans – supplementary guidelines*<sup>26</sup> and *Addressing fisheries and aquaculture in National Adaptation Plans – supplementary guidelines*.<sup>27</sup>
13. Building on these experiences, FAO – together with UNDP – leads the Scaling up Climate Ambition on Land Use and Agriculture through NDCs and National Adaptation Plans (SCALA) programme,<sup>28</sup> a new (2020–2025) EUR 20 million initiative<sup>29</sup> that addresses biodiversity priorities under NAPs and NDCs, and works in partnership with the Secretariats of the Commission and the International Treaty on Plant Genetic Resources for Food and Agriculture.
14. FAO has also supported the enhancement of climate change mitigation through other projects, for instance a project in India that increases carbon sequestration through sustainable forest management.<sup>30</sup>
15. FAO has continued to strengthen farmers’ resilience to the impacts of climate change through the management of plant genetic resources. In Mexico, local capacities have been strengthened to support long-term plans and actions for the conservation and sustainable use of plant genetic resources, and traditional diverse systems such as milpa are being adapted to climate change through participatory genetic improvement.<sup>31</sup> In China, the *in situ* conservation and sustainable use of significant indigenous local crops are being mainstreamed into policies at various levels in order to increase resilience to climate change.<sup>32</sup>
16. In Cuba, FAO supports existing plant and animal breeding programmes in the development of breeds and varieties with genes that confer tolerance of abiotic stress conditions.<sup>33</sup> The project takes a participatory approach in that it holds workshops and interviews with local residents in order to identify and select potential species for breeding.
17. FAO has continued to provide technical support to countries on REDD+, including on aspects of measuring and monitoring forest biodiversity and on ensuring that the implementation of REDD+ actions is consistent with the conservation of natural forests and biological diversity. Ninety-four percent of 31 reviewed National REDD+ Strategies and Action Plans propose action to maintain forest biodiversity and ecosystem services from forests, which makes them a priority for FAO’s country work. FAO has continued to support countries in the analysis, tracking and reporting of how the conservation of natural forests and protection of biological diversity are institutionalized in their legal

<sup>23</sup> <http://www.fao.org/3/ca6333en/CA6333EN.pdf>

<sup>24</sup> <http://www.fao.org/in-action/naps/adaptation-planning/guidelines/en/>

<sup>25</sup> <http://www.fao.org/in-action/naps/en/>

<sup>26</sup> <http://www.fao.org/documents/card/en/c/cb1203en>

<sup>27</sup> <http://www.fao.org/3/a-i6714e.pdf>

<sup>28</sup> <http://www.fao.org/news/story/en/item/1254976/>

<sup>29</sup> <http://www.fao.org/news/story/en/item/1254976/>

<sup>30</sup> GCP /IND/183/GFF Green-Ag: Transforming Indian Agriculture for Global Environmental Benefits and the Conservation of Critical Biodiversity and Forest Landscapes.

<sup>31</sup> GCP/MEX305/GFF Securing the Future of Global Agriculture in the Face of Climate Change by Conserving the Genetic Diversity of the Traditional Agroecosystems of Mexico.

<sup>32</sup> GCP/CPR/061/GFF On-farm Conservation and Sustainable Use of Genetic Diversity of Crops Originated in China.

<sup>33</sup> GCP /CUB/017/GFF Introduction of New Farming methods for the Conservation and Sustainable Use of Biodiversity, including Plant and Animal Genetic Resources, in Production Landscapes in Selected areas of Cuba.

and policy frameworks and implemented in practice consistent with the UNFCCC safeguard requirements for REDD+. It has also supported countries in the development of policies and measures consistent with these objectives, with a view to halting deforestation and mitigating climate change.

18. FAO continues its decade-long support to the African Union Commission, the Pan-African Agency of the Great Green Wall and member countries in implementing the Great Green Wall for the Sahara and the Sahel Initiative. Specifically through the Action Against Desertification programme, and thanks to the European Union and Turkish funds, 55 000 hectares across Burkina Faso, Ethiopia, the Gambia, Mali, Mauritania, Niger, Nigeria, Senegal and Sudan were planted with diverse trees and herbaceous fodder species useful to rural communities for degraded land restoration and rehabilitation. A total of 100 tonnes of forest seed and over 5 million seedlings of 110 woody and herbaceous fodder species were produced and planted in support of this restoration work.<sup>34</sup> Successes and lessons learned from these interventions have been compiled in a restoration manual published by FAO.<sup>35</sup>

19. Africa's Great Green Wall has become a blueprint for integrated response to the effects of climate change, biodiversity loss, water scarcity, desertification and land degradation, promoting socio-economic development and increasing resilience across large areas of dryland.<sup>36</sup> A concerted UN System effort is in place to support it with an action plan that aims, by 2030, to contribute to: (i) the restoration of 100 million hectares of currently degraded lands and their biodiversity; (ii) the creation of 10 million green jobs; and (iii) the sequestration of 250 million tonnes of CO<sub>2</sub>.

*Facilitate country access to financing for the food and agricultural sectors by leveraging national and international climate finance*

20. FAO is supporting the African Union in the implementation and monitoring of the African Forest Landscape Restoration Initiative (AFR100), which is aiming to restore 100 million hectares of degraded land by 2030, and the mobilization of resources for this initiative, through the development of a multicountry project for Green Climate Fund (GCF) funding. It is also supporting the African Union in the deployment of the Great Green Wall in Southern Africa through the development of a Global Environment Facility (GEF) Impact Programme on sustainable forest management and landscapes in drylands.

21. FAO has developed the Biodiversity Integrated Assessment and Computation Tool (B-INTACT),<sup>37</sup> which seeks to provide a biodiversity assessment of project-level activities in the agriculture, forestry and other land use (AFOLU) sector. The tool aims to quantify the biodiversity impact of climate investments at project and policy levels, provide decision-makers with a set of policy indicators to help informed decision-making, extend the scope of environmental assessments to capture biodiversity concerns, which are not accounted for in conventional carbon pricing, and support countries in accessing funds from international financial institutions and mechanisms to finance projects, programmes and policies. The focus of the tool is on forests rather than GRFA.

*Develop new codes of practice, guidelines, standards and other documents that support countries in addressing climate change more effectively*

22. FAO has published the document *Measuring and modelling soil carbon stocks and stock changes in livestock production systems*,<sup>38</sup> which will be tested in pilot countries (Costa Rica, Indonesia and Kenya) throughout 2021, to support the monitoring of the effects of sustainable grazing practices on soil organic matter for carbon sequestration, grassland restoration and plant diversity.

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<sup>34</sup> Sacande, M., Parfondry, M. & Martucci A. 2020. Diversity of restoration plants for Africa's Great Green Wall implementation. *Nature & Faune*, 33: 86–97.

<sup>35</sup> <http://www.fao.org/documents/card/en/c/ca6932en/>

<sup>36</sup> Sacande, M. & Berrahmouni, N. 2018. Africa's Great Green Wall: A transformative model for rural communities' sustainable development. *Nature & Faune*, 32: 90–99.

<sup>37</sup> <http://www.fao.org/tc/exact/b-intact/en/>

<sup>38</sup> <http://www.fao.org/3/ca2933en/CA2933EN.pdf>

23. FAO has also published the first global assessment of trees, forest and land use in drylands<sup>39</sup> and a practical manual on restoration to support rural communities' resilience in the Great Green Wall programme.<sup>40</sup>

*Strengthen national and regional institutional capacity to generate, collect and use data and information that enhances their ability to address climate change adaptation and mitigation*

24. FAO's Global Soil Partnership has launched RECSOIL,<sup>41</sup> an initiative for the re-carbonization of soils, as a mechanism for scaling up soil organic carbon sequestration in the agricultural sector. The implementation of RECSOIL will bring multiple benefits, including enhancement of key ecosystem services provided by soils.

*Increase knowledge and technical support to countries on climate-smart agriculture approaches*

25. FAO continues to support countries in the implementation of the CSA approach, preparing and sharing knowledge products to guide actions needed to transform and reorient agricultural systems to effectively support development and ensure food security in a changing climate. The publication *Climate-smart agriculture and the Sustainable Development Goals: Mapping interlinkages, synergies and trade-offs and guidelines for integrated implementation*<sup>42</sup> presents an assessment and mapping of CSA–SDG interlinkages. These provide entry points for targeted CSA planning to enhance synergies and reduce potential trade-offs between CSA objectives and SDGs. The publication also provides guidelines for the integration of CSA implementation steps with the 2030 Agenda. Another publication, *Operational guidelines for the design, implementation and harmonization of monitoring and evaluation systems for climate-smart agriculture*,<sup>43</sup> addresses the core constraints and needs of FAO Members with regard to both the design and the implementation of monitoring and evaluation systems that can simultaneously address CSA and sector reporting requirements for the 2030 Agenda, the Sendai Framework and the Paris Agreement. The two documents will be tested in pilot countries (Botswana and Ecuador) throughout 2021.

26. FAO supports countries in the use of CSA to develop agricultural strategies that help secure sustainable production, incomes and food security under climate change. These activities provide the means to help stakeholders, at all levels from local to national and international, to identify agricultural strategies suitable for their local conditions. The use of locally adapted plant varieties and animal breeds is a key strategy promoted by the CSA approach for climate change adaptation and resilience building.<sup>44</sup> For example, the Climate-Smart Cocoa project in Ecuador promotes the conservation of the genetic diversity of native fine-flavour varieties for their adaptive and quality characteristics, as well as the utilization of these varieties in cocoa agroforestry systems.<sup>45</sup> The diversification of agricultural production systems and agro-ecosystems is another key resilience-building strategy in CSA projects and provides co-benefits for income generation and carbon sequestration. Climate-smart agroforestry systems promoted in the Dry Corridor of Central America achieve this by integrating fruit, timber and fodder-tree species in traditional maize–bean cropping systems.<sup>46</sup>

27. Since 2015, FAO has hosted the Global Alliance for Climate Smart Agriculture (GACSA), the only global multistakeholder platform with more than 500 member institutions from among key stakeholder groups (private sector organizations, academia, NGOs, civil society organizations, intergovernmental organizations and countries) working together to scale up CSA.

<sup>39</sup> <http://www.fao.org/documents/card/en/c/ca7148en>

<sup>40</sup> <http://www.fao.org/documents/card/en/c/ca6932en/>

<sup>41</sup> <http://www.fao.org/global-soil-partnership/resources/highlights/detail/en/c/1201385/>

<sup>42</sup> <http://www.fao.org/3/ca6043en/CA6043EN.pdf>

<sup>43</sup> <http://www.fao.org/3/ca6077en/CA6077EN.pdf>

<sup>44</sup> <http://www.fao.org/climate-smart-agriculture-sourcebook/en/>

<sup>45</sup> Implemented under GCP /GLO/534/ITA: International Alliance on Climate Smart Agriculture.

<sup>46</sup> FMM/GLO/112/MUL BABY03: Climate-Smart Agroforestry Systems for the Dry Corridor of Central America.

## **Outcome 2. Improved integration of food security and nutrition, agriculture, forestry and fisheries considerations within the international agenda on climate change through reinforced FAO engagement**

*Ensure that the perspectives of food security and nutrition, agriculture, forestry and fisheries, rural livelihoods and natural resource management and conservation are appropriately prioritized in international fora addressing climate change*

28. FAO and UNEP are the lead organizations<sup>47</sup> for the UN Decade on Ecosystem Restoration (2021–2030).<sup>48</sup> The UN Decade positions the restoration of ecosystems as a major nature-based solution for meeting a wide range of global development goals and national priorities pertaining to all terrestrial and marine ecosystems. It builds on existing commitments such as the Paris Agreement and the Bonn Challenge and will be implemented in collaboration with Rio Conventions and other partners. The full strategy for the UN Decade is currently undergoing global public consultation and is available on the Decade website.<sup>49</sup> The UN Decade is expected to be presented at the fifteenth meeting of the Conference of the Parties to the CBD, the twenty-sixth meeting of the Conference of the Parties to the UNFCCC and the fifteenth meeting of the Conference of the Parties to the United Nations Convention to Combat Desertification. FAO has prepared a position paper for consultation by FAO Members that provides guidance on the concept of ecosystem restoration and related needs and priorities for forest landscapes and ecosystems used for farming, livestock production and fish production.<sup>50</sup> For FAO, the ultimate objective of restoration is to reverse the negative trends prevailing in many unsustainable agricultural systems – optimizing ecological interactions among plants, animals, humans and the environment, while leaving no-one behind.

*Work with relevant funding bodies to promote higher profiling of the food and agricultural sectors in financing decisions related to climate change*

29. As an accredited entity to the GCF, FAO supported the development of FAO–GCF full proposal projects and FAO-GCF Readiness Programme projects with a total value of USD 571.5 million in 2020.<sup>51</sup>

30. The GEF is an increasingly important partner for FAO, as both share key priorities such as biodiversity mainstreaming, climate change adaptation, land-degradation neutrality and transboundary water and fisheries management. FAO manages a USD 864 million portfolio (191 projects) covering all GEF focal areas and is implementing GEF projects in more than 130 countries.<sup>52</sup> FAO is the lead agency for the integrated GEF-7 Dryland Sustainable Landscapes Impact Program (DSL IP),<sup>53</sup> which takes an innovative, transformational approach to tackling the challenges threatening the fragile ecosystems of the drylands. FAO's GEF Capacity-building Initiative for Transparency (CBIT) portfolio helps countries to enhance transparency in the implementation of their NDCs<sup>54</sup> and in the provision of support to the AFOLU sector.<sup>55</sup>

31. FAO is the lead implementing agency for the GEF Drylands Impact Program, a USD 100 million effort to address land degradation through investments in sustainable production and sustainable forest management across 11 countries over the next five years. An important component of this is improving local seed varieties and crop diversity to improve food security and promote sustainable agricultural product value chains. FAO is also a key partner in the Food Systems, Land Use and Restoration (FOLUR) Impact Program. This USD 400 million initiative across 28 countries focuses on eliminating deforestation from key agricultural commodity supply chains. An important

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<sup>47</sup> <https://www.decadeonrestoration.org/partners>

<sup>48</sup> A/RES/73/284.

<sup>49</sup> <https://www.decadeonrestoration.org/what-decade>

<sup>50</sup> COFO/2020/Inf.7.

<sup>51</sup> <http://www.fao.org/climate-change/international-finance/green-climate-fund/en/>

<sup>52</sup> <http://www.fao.org/gef/our-work/en/>

<sup>53</sup> <http://www.fao.org/gef/dryland-sustainable-landscapes/en/>

<sup>54</sup> <http://www.fao.org/climate-change/our-work/what-we-do/transparency/en/>

<sup>55</sup> <http://www.fao.org/in-action/boosting-transparency-forest-data/en/>

component of this effort will address improvements to seed stocks in key commodity crops such as rice, wheat, palm and cacao.

*Maintain and strengthen its role as a provider of global data and information resources and knowledge and technologies on climate change adaptation and mitigation, including global goods such as data on food insecurity around the world, and global greenhouse gas databases on agriculture and land use*

32. In collaboration with the International Institute for Applied Systems Analysis (IIASA), FAO has continuously over the past 30 years been developing the Global Agro-Ecological Zones (GAEZ) for use in assessing agricultural resources and potentials. The last version of GAEZ was developed, and the data portal updated, in 2020. The GAEZ database contains geospatial data on, and maps of, land and water resources (including soil resources, terrain resources, land cover, protected areas and selected socio-economic and demographic data), agroclimatic resources and yield potentials in order to assist countries in land-use planning and sustainable land development. The database includes a feature on agro-ecological suitability and productivity, which presents data on the geographic suitability of 49 crops for various input-management levels, water supply system types and current and future climatic conditions (five climate models and four Representative Concentration Pathways). With this large amount of data, a new system is being created to make the data and information freely accessible to a variety of users and also to allow users to visualize and download data. The GAEZ database is a valuable tool for the adaptation of crop production to climate change in the interests of food security.

33. FAO maintains the Domestic Animal Diversity Information System, which provides access to a searchable database of information related to more than 8 800 livestock breeds from around the world. DAD-IS serves as the CBD's clearing house mechanism and early warning tool for animal genetic resources for food and agriculture and as the source of information for monitoring SDG Indicators 2.5.1 and 2.5.2 on the status of conservation programmes for animal genetic resources. Among the data fields in DAD-IS is one for adaptability to a specific environment. This currently holds entries for nearly 1 600 breed populations, information which may help livestock keepers choose appropriate genetic resources for adaptation to climate change.

34. FAO manages and continuously updates FAOSTAT, its statistical database, which provides free access to food and agriculture datasets from over 245 countries and territories, starting from 1961.<sup>56</sup> In 2020, FAO released new estimates of the percentage contribution of agriculture to total emissions of carbon dioxide, methane, nitrous oxide and in carbon-dioxide equivalents between 1990 and 2017.<sup>57</sup> These estimates are a significant component of newly published food-systems emissions estimates.<sup>58</sup> In addition, FAO released updated statistics on organic soils, specifically country estimates of area drained and the associated greenhouse-gas emissions. The dataset quantifies the areal extent of degradation of critical ecosystems such as boreal and tropical peatlands due to their drainage for agriculture over the period 1990 to 2019. The dataset also provides estimates of the related anthropogenic emissions of nitrous oxide and carbon dioxide.<sup>59</sup>

35. FAO works on the conservation, restoration and sustainable management of peatlands in the context of climate change and biodiversity in collaboration with various partners, including the Ramsar Convention on Wetlands. FAO is a founding member of the Global Peatlands Initiative, which helps to preserve peatland biodiversity and ecosystem services. Through the Global Soil Partnership, FAO contributes to the Global Soil Organic Carbon Map<sup>60</sup> and to peatland mapping and assessment initiatives. Further support to countries in this field has included the preparation of a publication on peatland mapping and monitoring<sup>61</sup> and the development of a geospatial online tool on peatland

<sup>56</sup> <http://www.fao.org/faostat/en/#home>

<sup>57</sup> <http://www.fao.org/economic/ess/environment/data/emission-shares/en/>

<sup>58</sup> <https://www.nature.com/articles/s43016-020-0031-z>

<sup>59</sup> <http://www.fao.org/economic/ess/environment/data/organic-soils;>  
<https://essd.copernicus.org/articles/12/3113/2020/>

<sup>60</sup> <http://www.fao.org/global-soil-partnership/pillars-action/4-information-and-data-new/global-soil-organic-carbon-gsoc-map/en/>

<sup>61</sup> <http://www.fao.org/3/CA8200EN/CA8200EN.pdf>



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restoration monitoring within the System for Earth Observation Data Access, Processing and Analysis for Land Monitoring (SEPAL) platform to help countries preserve critical carbon stores.<sup>62</sup>

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<sup>62</sup> <http://www.fao.org/news/story/en/item/1265487/icode/>