



# COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

## Item 5 of the Provisional Agenda

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

#### Twelfth Session

Rome, 10–12 December 2024

### CLIMATE CHANGE AND GENETIC RESOURCES FOR FOOD AND AGRICULTURE

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## I. INTRODUCTION

1. The Commission on Genetic Resources for Food and Agriculture (Commission), at its Nineteenth Regular Session, reviewed and simplified the voluntary draft questionnaire on genetic resources for food and agriculture (GRFA) and climate change.<sup>1</sup> It requested the Secretariat to finalize the questionnaire by September 2023 and subsequently circulate it to all National Focal Points to the Commission to coordinate national consultations and subsequent submissions, with a view to establishing a baseline of national responses for all sectors. It further requested the Secretariat to prepare a summary of responses to the questionnaire for consideration by the Intergovernmental Technical Working Groups (Working Groups).<sup>2</sup>
2. The Commission also requested the Secretariat to convene, after the completion of the questionnaire, a global multistakeholder workshop on climate change and GRFA, subject to the availability of the necessary funds. The workshop should aim to exchange information and experiences, including on pre-breeding and breeding programmes directed towards adaptation, resilience and mitigation traits, share views and priorities, taking into account the responses to the questionnaire, and discuss possible changes to the *Voluntary Guidelines to Support the Integration of Genetic Diversity into National Climate Change Adaptation Planning* (Voluntary Guidelines)<sup>3</sup> for consideration by the Commission at its Twenty-first Regular Session.
3. This document responds to these requests of the Commission. It provides an initial baseline report collated from a limited number of responses to the climate change questionnaire.<sup>4</sup> Furthermore, it follows up on the Commission's suggestions regarding the revision of the Voluntary Guidelines and the organization of a global multistakeholder workshop on climate change and GRFA.

## II. BACKGROUND

4. Climate change poses a significant threat to our ability to ensure global food security, eradicate poverty and achieve sustainable development. Based on observed and projected impacts of climate change on crops, livestock, fisheries, forestry and aquaculture climate change causes weather and climate extremes that may lead to irreversible impacts. Extreme events are increasing, causing substantial direct economic damage, and reducing economic growth, up to 15 years after the event. Around 10 percent of current areas of production will be climatically unsuitable by mid-century under high emission scenarios.<sup>5</sup> A third of global GHG emissions comes from the food system. The total greenhouse gas emissions of the food system were 18 Gt CO<sub>2</sub>e yr<sup>-1</sup> in 2015, representing 34 percent.<sup>6</sup>
5. A report by the World Meteorological Organization (WMO) underscores the alarming trend of climate change indicators reaching unprecedented levels in 2023.<sup>7</sup> It states that 2023 was the warmest year on record at 1.45 °C ± 0.12 °C above the pre-industrial average. Concentrations of greenhouse gases – carbon dioxide, methane and nitrous oxide reached record-high observed levels in 2022 and real-time data indicate that these have continued to increase in 2023.<sup>8</sup> The global mean sea level reached a record high, with the rate doubling in the last decade (2014–2023) since the first decade of

<sup>1</sup> CGRFA-19/23/Report, *Appendix B*.

<sup>2</sup> CGRFA-19/23/Report, paragraph 16.

<sup>3</sup> FAO. 2015. *Voluntary Guidelines to Support the Integration of Genetic Diversity into National Climate Change Adaptation Planning*. Rome. <http://www.fao.org/documents/card/en/c/290cd085-98f3-43df-99a9-250cec270867>

<sup>4</sup> CGRFA/WG-PGR-12/24/5/Inf.1.

<sup>5</sup> FAO. 2023. *Climate change impacts and adaptation options in the agrifood system*, Brief summary of the Intergovernmental Panel on Climate Change Sixth Assessment Report. Rome. <https://openknowledge.fao.org/handle/20.500.14283/cc5921en>

<sup>6</sup> Crippa, M., Solazzo, E., Guizzardi, D., Monforti-Ferrario, F., Tubiello, F.N. & Leip, A. 2021. Food systems are responsible for a third of global anthropogenic GHG emissions. *Nat. Food*. 2(3):198–209. doi: 10.1038/s43016-021-00225-9.

<sup>7</sup> WMO. 2024. *State of the Global Climate 2023*. WMO-No. 1347. Geneva, Switzerland. <https://library.wmo.int/idurl/4/68835>

<sup>8</sup> WMO Greenhouse gas Bulletin. 2023. *The State of Greenhouse Gases in the Atmosphere Based on Global Observations through 2022*. No. 19–15 November 2023. <https://library.wmo.int/records/item/68532-no-19-15-november-2023>

satellite record (1993–2002). The report further highlights how extreme weather events are progressively affecting food security and agriculture, with wider socio-economic implications.

6. According to the *2023 Global Report on Food Crises*,<sup>9</sup> 258 million people in 58 countries are facing high levels of acute food insecurity, with over two-thirds or 174 million people falling under this category because of climate and conflict. In addition, climate change affects disproportionately the incomes of rural women, people living in poverty and older populations, as their capacity to react and adapt to extreme weather and slow onset events is unequal, as stated in the FAO Unjust Climate report.<sup>10</sup> The FAO Unjust Climate report notes that, on average, female-headed households lose 8 percent more of their income due to heat stress and 3 percent more due to floods compared to male-headed households. This translates to a per capita reduction of USD83 due to heat stress and USD35 due to floods, totalling USD37 billion and 16 billion respectively across all low- and middle-income countries. Furthermore, the rising temperatures increase the dependency of poor households on climate-sensitive agriculture relative to that of non-poor households. A 1°C increase in average temperatures leads to a 53 percent increase in the farm incomes of poor households and a 33 percent decrease in their off-farm incomes, relative to non-poor households.

7. The *Climate Change 2023*<sup>11</sup> report of the Intergovernmental Panel on Climate Change (IPCC) noted that many agriculture, forestry and other land-use options provide adaptation and mitigation benefits that could be upscaled in the near term across most regions. The IPCC also notes the importance of integrated approaches to meet multiple objectives, including food security, and underscores that shifting to healthy diets and reducing food waste, along with sustainable agriculture, can reduce impacts on ecosystems and free up land for reforestation and biodiversity restoration. It further underlines that 22 percent of global greenhouse gas emissions come from agriculture, forestry, and land use and provides a clear way ahead, underscoring that the solution lies in climate-resilient development and holistic measures to adapt to climate change that also reduce or avoid greenhouse emissions.

8. With the urgency to take climate action and address an unprecedented food security crisis, FAO advocates the scaling up of investment in agriculture and champions efficient production and trade, accelerated innovation and adoption of appropriate technology. At the 28th Conference of the Parties (COP28) to the United Nations Framework Convention on Climate Change (UNFCCC), 160 countries stressed that agrifood systems are critical on the path to fully achieving the long-term goals of the Paris Agreement.<sup>12</sup>

9. The acute vulnerability of agrifood systems to climate change is compounded by other drivers of risk, including conflict and economic contraction.<sup>13</sup> At the same time, agrifood systems can play a central role in providing solutions to the climate and other crisis. Sustainable agrifood systems can help countries and communities to adapt to climate change, build resilience, and mitigate emissions, ensuring food security and nutrition while reversing environmental degradation and its impacts. Indeed, over 90 percent of all countries include agrifood system climate solutions in their Nationally Determined Contributions (NDCs) under the Paris Agreement – 94 percent prioritize adaptation and 91 percent prioritize mitigation in agrifood systems in the NDCs. Furthermore, 93 percent of countries promote adaptation of ecosystems and their services (terrestrial, freshwater and ocean and coastal),

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<sup>9</sup> FSIN and Global Network Against Food Crises. 2023. *GRFC 2023*. Rome.

<https://www.fsinplatform.org/sites/default/files/resources/files/GRFC2023-compressed.pdf>

<sup>10</sup> FAO. 2024. *The unjust climate – Measuring the impacts of climate change on rural poor, women and youth*. Rome. <https://doi.org/10.4060/cc9680en>

<sup>11</sup> IPCC. 2023. Summary for Policymakers. In: *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (Core Writing Team, H. Lee and J. Romero, eds.). IPCC, Geneva, Switzerland, pp. 1–34, doi: 10.59327/IPCC/AR6-9789291691647.001.

[https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC\\_AR6\\_SYR\\_SPM.pdf](https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_SPM.pdf)

<sup>12</sup> <https://www.cop28.com/en/food-and-agriculture>

<sup>13</sup> FAO, IFAD, UNICEF, WFP and WHO. 2023. *The State of Food Security and Nutrition in the World 2023. Urbanization, agrifood systems transformation and healthy diets across the rural–urban continuum*. Rome, FAO. <https://doi.org/10.4060/cc3017en>

which includes biodiversity for food and agriculture in their NDCs.<sup>14</sup> Building a comprehensive and aligned approach is necessary to tackle the interlinked climate, biodiversity and environmental crises.

### III. FAO ACTIVITIES ON CLIMATE CHANGE

10. The Commission, at its Nineteenth Regular Session, stressed the importance of continuing to increase capacity-building and training programmes on climate change adaptation and mitigation, in collaboration with existing intergovernmental and international bodies, with regard to all GRFA and within the broad framework of relevant global policies and strategies, including the *FAO Strategy on Climate Change 2022–2031*.<sup>15</sup>

11. The *FAO Strategy on Climate Change 2022–2031* and its Action Plan 2022–2025 take a comprehensive approach, considering various sectors such as crops and livestock production, forestry, fisheries and aquaculture, along with related value chains, livelihoods, biodiversity, water and ecosystems. The Strategy assists countries in aligning their agrifood systems with their national climate commitments and policies, including NDCs, National Biodiversity Strategies and Action Plans (NBSAPs) and Land Degradation Neutrality (LDN) targets. Based on the progress on implementation of the Action Plan of the FAO Strategy on Climate Action 2022–2031 in the 2022–2023 biennium,<sup>16</sup> development and implementation of the Strategy on Climate Change have successfully brought together FAO Members, divisions, centres, other headquarter units and all decentralized offices around a common narrative of scaling up finance and implementation of agrifood system solutions to climate change and building climate resilient agrifood systems.

12. Furthermore, guided by the FAO Strategy on Climate Change 2022–2031 and its Action Plan 2022–2025, FAO works with governments, academia, and communities worldwide to put sustainable agrifood systems at the heart of climate solutions, contributing to sustainable livelihoods and ecosystems. FAO continues supporting Members in aligning agrifood systems with multilateral commitments such as NDCs, NBSAPs and LDN targets. In 2023 alone, 81 percent of FAO country offices assisted national governments in developing and implementing NDCs, and 64 percent supported National Adaptation Plans (NAPs).<sup>17</sup>

13. In addition, FAO's initiatives such as Strengthening Agricultural Adaptation (SAGA)<sup>18</sup> and Scaling up Climate Ambition on Land Use and Agriculture through Nationally Determined Contributions and National Adaptation Plans (SCALA)<sup>19</sup> focus on implementing climate solutions in vulnerable regions. Moreover, the Kunming-Montreal Global Biodiversity Framework<sup>20</sup> and the UNFCCC COP28<sup>21</sup> outcomes, particularly the Global Stocktake and the Global Goal on Adaptation, make a clear acknowledgement of the importance of agriculture and food systems. More information on FAO's work is contained in the document *FAO's work on climate change*.<sup>22</sup>

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<sup>14</sup> Crumpler, K. *et al.* Forthcoming. *Agrifood systems in NDCs: Global Analysis*.

<sup>15</sup> FAO. 2022. *FAO Strategy on Climate Change 2022–2031*. Rome.

<https://openknowledge.fao.org/handle/20.500.14283/cc2274en>

<sup>16</sup> C 2025/8 Annex 5: Progress on implementation of the Action Plan of the FAO Strategy on Climate Action 2022–31 in the 2022–23 biennium.

<sup>17</sup> C 2025/8. Programme Implementation Report 2022–23. Rome.

<https://openknowledge.fao.org/handle/20.500.14283/no468en>

<sup>18</sup> <https://www.fao.org/in-action/saga/en/>

<sup>19</sup> <https://www.fao.org/in-action/scala/overview/about/en>

<sup>20</sup> <https://www.cbd.int/gbf>

<sup>21</sup> <https://unfccc.int/cop28>

<sup>22</sup> CGRFA/WG-PGR-12/24/5/Inf.2.

#### IV. DRAFT BASELINE REPORT ON GRFA AND CLIMATE CHANGE

14. In response to the Commission's request, the Secretariat finalized the questionnaire and circulated it to all National Focal Points to the Commission.<sup>23</sup> The summary of responses has been compiled into a draft baseline report.<sup>24</sup>

15. The draft baseline report is aimed at gathering information at country level on activities related to the impacts of climate change on GRFA and to the role of GRFA in climate change adaptation and mitigation. Furthermore, it offers a standard reference for all sectors to use, when developing future State of the World's reports.

16. Within the deadline, 39 responses to the questionnaire were received (Africa 7; Asia 2; Europe 18; Latin America and the Caribbean 4; Near East 6; North America 1; and Southwest Pacific 1). However, some responses have been submitted after the deadline and will be taken into account in the draft baseline report that will be submitted to the Commission at its next session. From the responses received it was evident that countries have recognized that GRFA play an important role in climate change adaptation and mitigation. However, from the countries that responded, for both adaptation and mitigation, policies that have been put in place do not exclusively address GRFA but do include the sustainable use and/or conservation of GRFA. Furthermore, it was evident that there are still a number of gaps that need to be addressed in order to help countries scale up their climate action. In particular, countries highlighted the need for better technical capacities, infrastructure and access to knowledge and equipment, as well as better collaboration among different offices within their countries.

#### V. REVISION OF THE *VOLUNTARY GUIDELINES TO SUPPORT THE INTEGRATION OF GENETIC DIVERSITY INTO NATIONAL CLIMATE CHANGE ADAPTATION PLANNING*

17. The Commission, at its Nineteenth Regular Session, requested the Secretariat to convene, after the completion of the questionnaire, a global multistakeholder workshop on climate change and GRFA, subject to the availability of the necessary funds. The workshop should aim to exchange information and experiences, including on prebreeding and breeding programmes directed towards adaptation, resilience and mitigation traits, share views and priorities, taking into account the responses to the questionnaire, and discuss possible changes to the *Voluntary Guidelines to Support the Integration of Genetic Diversity into National Climate Change Adaptation Planning* for consideration by the Commission at its Twenty-first Regular Session.<sup>25</sup>

18. The global multistakeholder workshop on climate change and GRFA is currently foreseen to take place after the Commission's Twentieth Regular Session. Taking into account the results of the questionnaire, it will facilitate an initial dialogue on potential modifications to the Voluntary Guidelines and serve as a platform for stakeholders to exchange information and experiences and share views and priorities. Following the workshop's outcomes, the Voluntary Guidelines could be further reviewed in regional consultations and, subsequently by the Working Groups and the Commission at their next sessions.

#### VI. GUIDANCE SOUGHT

19. The Working Group may wish to:
- i. recommend that the Commission invite Members to make use of the FAO tools and guidance on climate change adaptation and mitigation when developing or updating their NAPs and NDCs;
  - ii. take note of the draft baseline report and provide further guidance with regard to the further development of the report;

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<sup>23</sup> <http://www.fao.org/3/cd0475en/cd0475en.pdf>

<sup>24</sup> CGRFA/WG-PGR-12/24/5/Inf.1.

<sup>25</sup> CGRFA-19/23/Report, paragraph 17.

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- iii. urge National Focal Points to the Commission, that have not yet done so, to complete the questionnaire;
  - iv. recommend that the draft baseline report be revised in the light of further submissions by National Focal Points, for information of the Commission;
  - v. recommend that the global multistakeholder workshop on climate change and GRFA be convened before the Twenty-first session of the Commission to exchange information and experiences, share views and priorities, and discuss possible changes to the Voluntary Guidelines, taking into account the findings of the baseline report; and
  - vi. recommend that the Voluntary Guidelines be revised in light of the outcome of the workshop and taking into account the responses received to the questionnaire, for consideration in regional consultations and subsequently by the Working Groups and the Commission.