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COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

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TARGETS AND INDICATORS FOR PLANT 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 Thirteenth Regular Session, agreed on the *Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture* (Second GPA)[1] and welcomed it as a major achievement in the global efforts for the conservation and sustainable use of plant genetic resources for food and agriculture (PGRFA). The Second GPA was subsequently adopted by the FAO Council in November 2011.[2]

2. According to the Second GPA, overall progress on its implementation and the related follow-up processes will be monitored and guided by governments and other FAO Members through the Commission. To this end, the Commission, at its Fourteenth Regular Session, will agree on formats for progress reports as well as on criteria and indicators for monitoring the implementation of the Second GPA, building on previous work done by the Commission in the development of such indicators and reporting format.[3] The Commission, therefore, requested FAO to review existing indicators and identify or develop higher-order indicators which could be in the form of an index that could enable stakeholders at all levels to effectively monitor the implementation of the Second GPA.[4] It requested its Intergovernmental Technical Working Groups to continue to review targets and indicators of genetic diversity and biodiversity within their respective sectors, and to provide recommendations to the Commission on their further development.[5]

3. This document provides background information on the draft revised indicators and the draft revised reporting format for monitoring the implementation of the Second GPA. It also contains draft indicators for monitoring the implementation of the Second GPA as well as draft targets for plant genetic resources for food and agriculture, as reviewed by the Commission's Intergovernmental Technical Working Group on Plant Genetic Resources for Food and Agriculture (Working Group), for consideration by the Commission. A draft reporting format for monitoring the implementation of the Second GPA is given in the document CGRFA-14/13/Inf.9.

II. BACKGROUND

4. The Commission has repeatedly emphasized the importance of an efficient system for monitoring the implementation of the GPA in terms of planning, priority-setting and for the mobilization of financial resources to support national plant genetic resources programmes.[6] This led in 2004, to the adoption by the Commission of a list of 83 core indicators and a reporting format[7] for monitoring the implementation of all 20 priority activities of the GPA through a country-driven, participatory and capacity-building process, culminating in the establishment of National Information Sharing Mechanisms (NISM) in 73 countries.[8]

5. The indicators and the reporting format adopted in 2004 need to be revised to adequately reflect the changed priority activities of the Second GPA. The Second GPA reflects the new challenges and opportunities that have emerged with respect to the conservation and use of PGRFA since 1996, including climate change, as well as new developments in the policy environment, in particular the entry into force of the International Treaty on Plant Genetic Resources for Food and

[1] CGRFA-13/11/Report, paragraph 21.
[2] CL 143/REP, paragraph 43 CL 143/17 (*Appendix B*).
[3] The Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture, paragraph 316.
[4] CGRFA-13/11/Report, paragraph 98.
[5] CGRFA-13/11/Report, paragraph 99.
[6] CGRFA-7/97/REP paragraph 21; CGRFA-8/99/REP paragraphs. 17 and 29; CGRFA-9/02/REP paragraph 19; CGRFA/WG-PGR-1/01/REPORT paragraph 14; CGRFA-10/04/4 (CGRFA/WG-PGR-2/REPORT), paragraph 19.
[7] The indicators and reporting format for monitoring the implementation of the *Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture* were presented in the document CGRFA-10/04/Inf.5, *Indicators and reporting format for monitoring the implementation of the Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture*.
[8] Document CGRFA/WG-PGR-6/12/3.

Agriculture (International Treaty). With its streamlined and adjusted *priority activities*, the Second GPA puts greater emphasis on the sustainable use of PGRFA as a means to enhance food security in a changing environment.

6. The Second GPA is a supporting component of the International Treaty and its implementation is an essential contribution to achieving the objectives of the International Treaty. Monitoring the implementation of the Second GPA will therefore also help the Governing Body of the International Treaty to monitor the implementation of the International Treaty for which no monitoring framework similar to the one proposed for the Second GPA exists. The targets for PGRFA and the indicators for the monitoring of the implementation of the Second GPA also offer opportunities to strengthen cooperation between the Commission and the Governing Body of the Treaty. They could, for example, be extended to incorporate specific targets or indicators related to certain provisions of the Treaty, such as the Multilateral System of Access and Benefit Sharing, that are not covered by the Second GPA. This could help to further align reporting processes and methods and reduce reporting obligations for governments.

7. The recently adopted Aichi Biodiversity Targets, as well as the Targets of the Global Strategy for Plant Conservation 2011-2020 (GSPC) make the identification of targets and related indicators for PGRFA conservation and use particularly timely. Such indicators will also contribute to assess the contribution of PGRFA to food security and sustainable agricultural development.

III. PREPARATION OF DRAFT TARGETS AND INDICATORS

8. Taking into consideration, in particular, the availability and accessibility of data required as well as the importance of maintaining continuity in reporting through a country-led participatory process, FAO, including the Secretariats of the Commission and the International Treaty, in collaboration with the Global Crop Diversity Trust and the CGIAR, revised the existing indicators for monitoring the implementation of the Second GPA and developed targets for PGRFA. Following additional inputs received from National Focal Points (NFPs) as well as other experts, FAO reduced the number of indicators and prepared and refined targets for PGRFA. FAO held broad consultations on the draft targets and the draft revised indicators, including a global expert consultation which FAO convened in collaboration with the Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria (INIA), on 24 to 26 April 2012 in Madrid, Spain.

9. The Working Group, at its Sixth Session, welcomed the draft targets and draft revised indicators for monitoring the implementation of the Second GPA and considered it a timely initiative. The Working Group stressed the importance of monitoring all priority activities of the Second GPA through a country-led, participatory and capacity building process. The Working Group expressed appreciation for the efforts made to reduce the number of indicators without losing meaningful information, even though it noted that many indicators may be difficult to measure. The draft targets and the draft revised indicators for monitoring the implementation of the Second GPA, as reviewed by the Working Group, are contained in *Appendices I* and *II*. A draft reporting format is given in the document, *Reporting format for monitoring the implementation of the Second GPA*.[9]

IV. KEY FEATURES

Indicators for monitoring the implementation of the Second GPA

10. The proposed draft indicators, as given in *Appendix I*, are specific, measurable, achievable, relevant and time-bound. They fit within the same conceptual framework applied for monitoring the GPA, that was based on the "driving force-state-response" model. Where possible and appropriate, the indicators have been revised with a view to facilitate the preparation of periodic snapshot assessments and particular attention has been paid to the identification of indicators that can be applied by all Member Countries. As a result of this streamlining approach, the number of indicators could be reduced considerably when compared to the number of core indicators used previously. The draft

[9] CGRFA/WG-PGR-6/12/Inf.1.

indicators are proposed to be time-bound to the reporting period requested by the Commission and intended to monitor progress in the implementation of the Second GPA at the national level. Unless otherwise specified, the indicators apply to the national level.

Reporting format for monitoring the implementation of the Second GPA

11. The reporting format serves the purpose of guiding National Focal Points in the assessment of progress in conservation and use of PGRFA, including in the preparation of their Country Reports. In addition, the reporting format may be used by the NFPs to involve other stakeholders to contribute valuable information to assessments and Country Reports. The structure of the reporting format follows the order of the indicators as provided for each of the 18 Priority Activities of the Second GPA given in *Appendix I*. Each question responds to one or more indicators. In order to facilitate data analysis the answers to almost all the questions of the reporting format must be compiled in tabular formats and include accountable variables, multiple-choice options and figures.

Targets for plant genetic resources for food and agriculture

12. Three mutually supportive targets are proposed to address the main objectives of the Second GPA: conservation; sustainable use; and capacity development.
The proposed targets are:

- PGRFA Conservation Target: *By 2020, the genetic diversity of cultivated plants and their wild relatives, as well as of wild food plant species is maintained* in situ, *on farm and* ex situ *in a complementary manner;*
- PGRFA Sustainable Use Target: *By 2020, there has been an increased use of plant genetic resources for food and agriculture to improve sustainable crop production intensification and livelihoods while reducing genetic vulnerability of crops and cropping systems;* and
- PGRFA Institutional and Human Capacities Target: *By 2020, people are aware of the values of plant genetic resources for food and agriculture and institutional and human capacities are strengthened to conserve and use them sustainably while minimizing genetic erosion and safeguarding their genetic diversity.*

13. The proposed targets are in line with the Aichi Targets 1, 7 and, in particular, 13, as contained in the Strategic Plan for Biodiversity for the period 2011-2020 adopted by the Tenth meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD). Aichi Target 13 to maintain the genetic diversity of cultivated plants and wild relatives by 2020 is reflected in both, the PGRFA Conservation Target and the PGRFA Sustainable Use Target, which also address Aichi Target 7. The PGRFA Institutional and Human Capacities Target addresses an important aspect of Aichi Target 13 related to the development and implementation of strategies minimizing genetic erosion and safeguarding genetic diversity of PGRFA. The PGRFA Institutional and Human Capacities Target also contributes to Aichi Target 1, according to which, by 2020, at the latest, people shall be aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.

14. The indicators, as given in *Appendix I*, provide, in the aggregate, a comprehensive picture of the implementation of the Second GPA and the status of achievement of the three targets, as given in *Appendix II*. If the Commission so wishes, the proposed indicators may be further elaborated into three composite indices. The composite indices would have the advantage of providing an overall synthetic picture of the progress made with regards to the three targets.

V. FOLLOW-UP AND FUTURE ACTIVITIES

15. Effective monitoring of the implementation of the Second GPA will continue to require National Focal Points to play an important role in contributing to and coordinating country-based data repositories for the agreed indicators and targets, the *National Information Sharing Mechanisms.* Building capacity for data management and analysis will continue to be essential in this regard.

16. Data recorded in the NISM databases may be used as a baseline for a number of indicators. However, for some indicators as well as in countries which have not yet established a NISM database,

baselines will have to be established based on data gathered through the new reporting format. Monitoring the Second GPA will contribute to the preparation of *The Third Report on the State of the World's Plant Genetic Resources for Food and Agriculture* (Third Report) and the schedule for monitoring reports will be in sync with the preparation of the Third Report.[10]

17. Additional work is required for the development of composite indices. If the Commission decides to task FAO with the development of composite indices, the work required would include weighting the relative relevance of the underlying concepts of the selected indicators that contribute to the three proposed composite indices.

18. Monitoring the implementation of the Second GPA will require the release of an upgrade of the computer application that is currently in use to manage the information addressed by the indicators and reporting format for the GPA. This will ensure continuity of monitoring efforts undertaken by countries and facilitate a transparent and accessible monitoring system. The upgraded computer application will simplify data recording and processing, including the calculation of indices, as well as analysis and the sharing of results.

VI. GUIDANCE SOUGHT

19. The Commission may wish to:

a) Review and revise, as necessary, the draft indicators for monitoring the implementation of the Second GPA, as contained in *Appendix I* as well as the targets contained in *Appendix II* and adopt them;
b) Request FAO to reflect any modifications to any of the targets or the indicators in the reporting format for monitoring the implementation of the Second GPA;
c) Submit the indicators, as adopted by the Commission, through its Secretary, to the Conference of the Parties of the Convention on Biological Diversity as indicators for Aichi Target 13;
d) Request FAO to upgrade the existing computer application for monitoring the Second GPA, including its user manual, to fully enable the management of the indicators and reporting format for monitoring the implementation of the Second GPA in all languages in which the computer application is currently available, subject to availability of resources, as well as to assist countries in building capacity in the management and use of the indicators and the computer application, as required;
e) Request FAO to examine the data gathered from the revised indicators and reporting format and, based on the collected data, identify indicators that may be suitable for the elaboration of composite indices, and report the results to the Commission or its Working Group, for their consideration.

[10] *See* CGRFA-14/13/21.

APPENDIX I

DRAFT REVISED INDICATORS FOR MONITORING THE IMPLEMENTATION OF THE SECOND GLOBAL PLAN OF ACTION FOR PLANT GENETIC RESOURCES

In situ conservation and management

Priority Activity 1: Surveying and inventorying plant genetic resources for food and agriculture

- Number of *in situ* (including on farm) surveys/inventories of PGRFA[11] carried out
- Number of PGRFA surveyed/inventoried
- Percentage of PGRFA threatened out of those surveyed/inventoried[12]

Priority Activity 2: Supporting on-farm management and improvement of plant genetic resources for food and agriculture

- Number of farming communities involved in on-farm PGRFA management and improvement activities
- Percentage of cultivated land under farmers' varieties/landraces in areas of high diversity and/or risk[13]
- Number of farmers' varieties/landraces delivered from national or local gene banks to farmers (either directly or through intermediaries)[14]

Priority Activity 3: Assisting farmers in disaster situations to restore crop systems

- Number of households that received seeds for planting as an aid after disaster situations
- Percentage of seed produced at the local level[15] out of that made available through disaster response interventions
- Existence of disaster risk management policies for restoring crop systems that include seed security provisions

Priority Activity 4: Promoting *in situ* conservation and management of crop wild relatives and wild food plants

- Number of crop wild relatives and wild food plants *in situ* conservation and management actions with institutional support
- Percentage of national *in situ* conservation sites with management plans addressing crop wild relatives and wild food plants
- Number of crop wild relatives and wild food plants species actively[16] conserved *in situ*

Ex situ Conservation

Priority Activity 5: Supporting targeted collecting of plant genetic resources for food and agriculture

- Existence of a strategy for identification of gaps in collections held by national gene banks and for targeted collecting missions to fill identified gaps
- Number of targeted collecting missions in the country
- Number of accessions resulting from targeted collecting missions in the country

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[11] PGRFA means any genetic material of plant origin of actual or potential value for food and agriculture (definition from ITPGRFA, 2001).

[12] Also listed in Priority Activity 16: Developing and strengthening systems for monitoring and safeguarding genetic diversity and minimizing genetic erosion of plant genetic resources for food and agriculture.

[13] Out of the total cultivated land in the same areas.

[14] Also listed in Priority Activity 10: Promoting diversification of crop production and broadening crop diversity for sustainable agriculture.

[15] Produced in neighbouring areas with similar agro-ecological conditions.

[16] By "actively conserved" it is meant that the target species are specifically addressed by the management plan of the conservation area.

- Number of crops collections conserved in the national gene bank(s) that require targeted collecting

Priority Activity 6: Sustaining and expanding *ex situ* conservation of germplasm

- Trend in annual capacity for sustaining *ex situ* collections
- Number of crops conserved *ex situ* under medium or long-term conditions[17]
- Number of species conserved *ex situ* under medium or long-term conditions
- Number of accessions conserved *ex situ* under medium or long-term conditions
- Percentage of *ex situ* accessions safety duplicated

Priority Activity 7: Regenerating and multiplying *ex situ* accessions

- Percentage of *ex situ* accessions for which a budget for regeneration does not exists
- Number of *ex situ* accessions regenerated and/or multiplied
- Percentage of *ex situ* accessions in need of regeneration

Sustainable use

Priority Activity 8: Expanding the characterization, evaluation and further development of specific collection sub-sets to facilitate use

- Average number of morphological and eco-geographical traits characterized per accession for the *ex situ* collections
- Number of publications on germplasm evaluation and molecular characterization
- Number of trait-specific collection subsets published
- Number of accessions distributed by gene banks to users of germplasm
- Number of samples distributed by gene banks to users of germplasm

Priority Activity 9: Supporting plant breeding, genetic enhancement and base-broadening efforts

- Number of crops with active public pre-breeding and breeding programmes
- Number of crops with active private pre-breeding and breeding programmes
- Number of active public crop breeders
- Number of active private crop breeders
- Number of new varieties released[18]
- Number of breeding activities oriented to small scale farmers, villages or traditional communities

Priority Activity 10: Promoting diversification of crop production and broadening crop diversity for sustainable agriculture

- Number of programmes/projects/activities to increase genetic heterogeneity of crop species and diversity within the agro-ecosystem
- Number of new crops and/or wild species introduced into cultivation
- Number of farmers' varieties/landraces delivered from national and local gene banks to farmers (either direct or through intermediaries)[19]
- Number of crops conserved *ex situ* under medium or long term conditions[20]

[17] Also listed in Priority Activity 10: Promoting diversification of crop production and broadening crop diversity for sustainable agriculture.
[18] Also listed in Priority Activity 12: Supporting seed production and distribution.
[19] Also listed in Priority Activity 2: Supporting on-farm management and improvement of plant genetic resources for food and agriculture.
[20] Also listed in Priority Activity 6: Sustaining and expanding *ex situ* conservation of germplasm.

Priority Activity 11: Promoting development and commercialization of all varieties, primarily farmers' varieties/landraces and underutilized species

- Number of programmes/projects/activities promoting development and commercialization of all varieties, primarily farmers' varieties/landraces and underutilized species
- Number of farmers' varieties/landraces and underutilized species with potential for commercialization identified
- Existence of national policies that promote development and commercialization of all varieties, primarily farmers' varieties/landraces and underutilized species

Priority Activity 12: Supporting seed production and distribution

- Number of new varieties released[21]
- Number of formal/registered seed enterprises
- The least number of varieties that together account for 80% of the total area for each of the five most widely cultivated crops
- Percentage of area supplied with seed meeting the standard of the formal seed sector for the five most widely cultivated crops
- Existence of a national seed policy and seed law

Building institutional and human capacities

Priority Activity 13: Building and strengthening national programmes

- Existence of a national entity (agency, committee, etc.) functioning as a coordination mechanism for PGRFA activities and/or strategies
- Existence of a formally appointed national focal point or coordinator for PGRFA
- Existence of a governmental policy framework and strategies for PGRFA conservation and use
- Existence of a national information sharing mechanism for PGRFA

Priority Activity 14: Promoting and strengthening networks for plant genetic resources for food and agriculture

- Membership in a regional PGRFA network
- Number of crop improvement networks in which national stakeholders are members
- Number of publications produced by national stakeholders within the framework of networks

Priority Activity 15: Constructing and strengthening comprehensive information systems for plant genetic resources for food and agriculture

- Number of crop wild relatives conserved *in situ* documented in a publicly available information system
- Number of farmers' varieties/landraces cultivated on-farm and documented in a publicly available information system
- Number of accessions in *ex situ* collections documented in a publicly available information system
- Number of released varieties documented in a publicly available information system
- Participation in publicly accessible, international/regional PGRFA information systems

Priority Activity 16: Developing and strengthening systems for monitoring and safeguarding genetic diversity and minimizing genetic erosion of plant genetic resources for food and agriculture

- Percentage of PGRFA threatened out of those surveyed/inventoried[22]
- Existence of national systems to monitor and safeguard genetic diversity and minimize genetic erosion

[21] Also listed in Priority Activity 9: Supporting plant breeding, genetic enhancement and base-broadening efforts.
[22] Also listed in Priority Activity 1: Surveying and inventorying plant genetic resources for food and agriculture.

- Number of remedial actions resulting from the existing national systems to monitor and safeguard genetic diversity and minimize genetic erosion

Priority Activity 17: Building and strengthening human resource capacity

- Existence of post-graduate, graduate and secondary educational and training programmes with incorporated aspects on PGRFA conservation and sustainable use
- Percentage of staff whose knowledge and skills in conserving and using PGRFA have been upgraded

Priority Activity 18: Promoting and strengthening public awareness of the importance of plant genetic resources for food and agriculture

- Existence of a public awareness programme promoting PGRFA conservation and utilization
- Number of stakeholder groups participating in the implementation of the public awareness programme
- Number of types of products developed to raise public awareness

APPENDIX II

DRAFT TARGETS FOR PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Conservation of PGRFA

Target: *By 2020, the genetic diversity of cultivated plants and their wild relatives, as well as of wild food plant species is maintained* in situ*, on farm and* ex situ *in a complementary manner.*

Technical Rationale: Plant genetic resources for food and agriculture are conserved in farmers' fields, seed and field gene banks and wild habitats. The conservation of PGRFA in natural ecosystems and their on-farm management provide for the continued evolution and adaptation of these resources to changing environmental forces, and thus for the generation of new diversity that is important for future crop improvements. A large and important amount of PGRFA, vital to world food security, is stored *ex situ*. The safety of the genetic material already collected should be secured and its regeneration and safety duplication provided. Conservation planning and decision-making require regular monitoring of the existing diversity of PGRFA, its distribution and evolution over time.

Sustainable use

Target: *By 2020, there has been an increased use of plant genetic resources for food and agriculture to improve sustainable crop production intensification and livelihoods while reducing genetic vulnerability of crops and cropping systems.*

Technical Rationale: PGRFA are used by farmers either directly or after research, improvement, seed multiplication and distribution processes. Their sustainable use allows to take full advantage of their potential to reduce hunger and poverty, and provide options for agriculture to cope with climate change. Accessing a large gene pool from gene bank collections is a pre-requisite for the improvement of plant varieties with new traits, such as higher yields and resistance or tolerance to environmental and biological stresses. The diversification among and within crops contributes to the resilience and long-term sustainability of agricultural systems, thus ensuring food, nutritional and income security. The introduction of new crops and/or wild species into cultivation as well as the identification of underutilized species with potential for commercialization are part of a broad effort to enhance diversity in farming systems.

Institutional and human capacities

Target: *By 2020, people are aware of the values of plant genetic resources for food and agriculture and institutional and human capacities are strengthened to conserve and use them sustainably while minimizing genetic erosion and safeguarding their genetic diversity.*

Technical Rationale: Effective conservation and sustainable use of PGRFA require an enabling institutional framework and human resources capacities. Governments should have a functioning policy framework on conservation and sustainable use of PGRFA which empowers a strong national programme with facilitated access to information on, *inter alia*, *ex situ* germplasm, including passport, characterization and evaluation data, *in situ* geo-referenced inventories of CWR and wild food plants, on farm landraces and cultivars together with their agronomic description, distribution and seed production data. Governments should also have strong capacity to respond to threats of PGRFA erosion in order to prevent loss of existing diversity. It is also vitally important for the national programme to relies on a well trained working force able to efficiently apply latest standards and technologies for conservation and use of PGRFA. Finally, public awareness raising is vital to a national programme, as it mobilizes popular opinion and spurs political action. One message, however, does not fit all audiences and public awareness interventions should be carefully planned and aligned with the interests and priorities of the target audiences.