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COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Item 3.2 of the Provisional Agenda
INTERGOVERNMENTAL TECHNICAL WORKING GROUP ON FOREST GENETIC RESOURCES
Third Session
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TARGETS AND INDICATORS FOR FOREST GENETIC RESOURCES

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I.   INTRODUCTION

1.   The Commission on Genetic Resources for Food and Agriculture (the Commission), at its Fourteenth Regular Session, reviewed and revised draft strategic priorities for action for forest genetic resources (FGR) and agreed on them as the *Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources* (GPA FGR). It invited the Director-General of FAO to bring the GPA FGR to the attention of the FAO Conference.[1] The FAO Conference, at its 38th Session in June 2013, adopted the GPA FGR.[2]

2.   The Commission considered a provisional list of indicators[3] and requested FAO to continue working on this list to monitor the state of the world's forest genetic resources and the status of implementation of the GPA FGR. It invited its Intergovernmental Technical Working Group on Forest Genetic Resources (Working Group) to review the indicators.[4]

3.   This document provides a provisional list of indicators designed to specifically monitor the implementation of each Strategic Priority of the GPA FGR and proposes a process to further improve and validate them.

II.   BACKGROUND

4.   In the framework of the implementation of the GPA FGR, appropriate targets and indicators are needed to monitor progress and measure trends on FGR conservation, sustainable use and development at national as well as regional and global levels.

5.   This document builds on the Thematic Study for the SOW FGR *Indicators of forest genetic diversity, erosion and vulnerability*.[5] The difference between the indicators in the thematic study and those proposed in Appendix 1 of this document is that the former defines indicators to monitor the state of FGR, and this document identifies indicators to measure progress towards implementation of the Strategic Priorities for action as included in the GPA-FGR. Thus the indicators proposed in *Appendix 1* are primarily response indicators.

III.   PROCESS FOR IDENTIFYING INDICATORS AND KEY CONSIDERATIONS

6.   The overarching goal of the first ever GPA FGR is to foster conservation, sustainable use and development of FGR worldwide. The GPA FGR is designed to be implemented at country, regional and global levels. Although most of the indicators will aim to monitor response and in some cases, benefits, other types of indicators will be required to monitor the outcomes (effectiveness) of the implementation of the GPA FGR. *Table 1* lists the different kinds of indicators that can be used to monitor both the progress in implementation and the effectiveness of the implementation, in terms of trends in the status of FGR, primarily state and pressure indicators.

7.   For monitoring the implementation of the GPA FGR, benefit and response indicators are needed. For monitoring the outcomes of the GPA FGR, state and pressure indicators are needed, first to establish a baseline and then for monitoring changes over time. Some of the Strategic Priorities for Action call for "promoting" various actions, which are more difficult to monitor than Strategic Priorities that call for an action.

8.   The indicators proposed in *Appendix 1* to this document are derived from the set of indicators presented in the Thematic Study, *Indicators of forest genetic diversity, erosion and vulnerability*.

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[1] CGRFA-14/13/Report, paragraph 52.
[2] C 2013/REP, paragraph 77.
[3] CGRFA-14/13/4.3 Appendix I.
[4] CGRFA-14/13/Report, paragraph 123.
[5] Graudal *et al.* (2014). *Indicators of forest genetic diversity, erosion and vulnerability*. Thematic Study for the SOW FGR.

9.   Indicators for monitoring biodiversity have been created at international, regional and national levels. Although some of the general biodiversity indicators can be used for monitoring the conservation and sustainable use and development of FGR, they generally do not apply. In defining indicators it is important to consider the availability of meaningful data, which varies widely from country to country. Some indicators require specific expertise.

10.   Indicators are meant to help define and achieve goals. As such, an indicator is a tool used to measure the attribute of an object related to implementing the GPA-FGR and its outcomes. This object is the unit of observation. Observations (also called variables or verifiers) used for describing an indicator can be of several formats, e.g. dichotomic, categorical or numerical. Variables need to be easily observable and usable, reliable, comparable across indicators and meaningful. Indicators can be grouped by domains and areas of relevance (also referred to as operational indicators).

11.   The GPA is a 10-year plan, but no targets are defined. These targets can be defined once the Commission has agreed on indicators.

Table 1   Indicators for monitoring FGR and how they can be classified according to their purpose

Basic question	Type of indicator	Intended significance of indicator
How is the status of FGR changing?	S – State	Analyzing the conditions and status – are we loosing genetic diversity? Where, which and how?
Why is genetic diversity being lost?	P - Pressure	Monitoring the extent and intensity of the causes of loss
What are the implications for society?	B - Benefit	Quantifying the benefits that humans derive from biodiversity
What does society do about it?	R - Response	Measuring the implementation of policies or actions to prevent or reduce loss

IV.   GUIDANCE SOUGHT

12.   The Working Group may wish to:

- review and revise, as necessary, the draft provisional indicators for monitoring the implementation of the GPA for the conservation, sustainable use and development of FGR, as given in *Appendix I* to this document;

- recommend that the Commission request FAO to finalize and validate the indicators, including status indicators, for final review by the Working Group at its next session; and

- recommend that the Commission request FAO to prepare for the next session of the Working Group a set of targets for the conservation, sustainable use and development of FGR as well as a draft schedule for monitoring the implementation of the GPA FGR.

APPENDIX I

SUMMARY LIST OF STRATEGIC PRIORITIES AND PROPOSED INDICATORS (Priority Area PA and Strategic Priority SP refer to the Global Plan of Action for the conservation, sustainable use and development of FGR: http://www.fao.org/3/a-i3849e.pdf)

Priority area	Strategic priority	Verifiable indicator	Level	Type of indicator
Priority area 1: Improving the availability of, and access to, information on FGR	SP1. Establish and strengthen national FGR assessment, characterization and monitoring systems	1- Is there a national system in place that makes it possible for the country to provide information on FGR assessment, characterization and monitoring? 2- Trend in number and proportion of species for which FGR are monitored and characterized.	National	Response / benefit
	SP2. Develop national and subnational systems for the assessment and management of traditional knowledge on FGR	Trend in number and proportion of species for which traditional knowledge on conservation and use of FGR has been documented (I)	National	Response / benefit
	SP3. Develop international technical standards and protocols for FGR inventories, characterization and monitoring of trends and risks	Are there international technical standards and protocols for FGR inventories, characterization and monitoring of trends and risks in place for use by each country as appropriate (D)	International	Response / benefit
	SP4. Promote the establishment and the reinforcement of FGR information systems (databases) to cover available scientific and traditional knowledge on uses, distribution, habitats, biology and genetic variation of species and species populations	Trend in number of species that are described for which distribution and/or genetic parameters are known, per country, and the information available in the FGR database (REFORGEN) (D)	International Regional National	Response / benefit
Priority area 2: *In situ* and *ex situ* conservation of FGR	SP5. Strengthen the contribution of primary forests and protected areas to *in situ* conservation of FGR	1- Trend in number of tree species populations managed as seed sources within Primary forest or Protected Areas for provision of forest reproductive. 2- Trend in number of tree species and species populations directly targeted for conservation in Primary forest and Protected Areas (D)	National	Response / benefit

	SP6. Promote the establishment and development of efficient and sustainable *ex situ* conservation systems, including *in vivo* collections and genebanks	1- Trend in number of collections in genebanks (seed banks, clone banks, DNA banks, pollen banks) 2- Trend and number of collections in arboreta 3- Trend in number conservation plantations and trials contributing to conservation (D)	National	Response / benefit
	SP7. Support assessment, management and conservation of marginal and/or range limits forest species populations	1- Trend in conservation action taken for species/ populations at risk (*ex situ*) (D) 2- Trend in number and proportion of marginal and range limit populations within species that are documented and conserved (I)	National	Response / benefit
	SP8. Support and develop sustainable management and conservation of FGR on farmland	Trend in number and proportion of important agroforestry species for which there is a conservation and/or sustainable use programme (I)	National	Response / benefit (S)
	SP9. Support and strengthen the role of forests managed by indigenous and local communities in the sustainable management and conservation of FGR	1. Trend in number, proportion and area of forests or conservation stands managed by local communities or indigenous people (*in situ*) 2. Trend in number, proportion of collections (*ex situ*) managed by local communities or indigenous people	National	Response / benefit (S)
	SP10. Identify priority species for action	Trend in number and proportion of priority species identified for action by countries	National	Response / benefit (S)
	SP11. Develop and implement regional *in situ* conservation strategies and promote ecoregional networking and collaboration	1- Number of tree species directly targeted in conservation programmes (D) 2- Conservation action is taken for species/ populations at risk (*in* and *ex situ*) (D) 3- A relevant network exists and is maintained over time. (D)	National Regional	Response / benefit
	SP12. Develop and reinforce national seed programmes to ensure the availability of genetically appropriate tree seeds in the quantities and of the (certified) quality needed for national plantation programmes	1- Trend and number of tree seed providers 2- Trend in number of tree species and seed sources for which regulation of use of forest reproductive material exist (D)	National	Response / benefit

Priority area 3: Sustainable use, development and management of FGR	SP13. Promote restoration and rehabilitation of ecosystems using genetically appropriate material	1- Guidelines/regulations for matching species, seed source and planting site are implemented (D) 2- Guidelines/regulations for composition and harvest of seed sources (number of mother trees) are implemented (D)	National	Response / benefit
	SP14. Support climate change adaptation and mitigation through proper management and use of FGR	1- Guidelines/regulations for matching species, seed source and planting site under climate change scenarios are implemented. (D) 2- Guidelines/regulations for composition and harvest of seed sources (number of mother trees) under climate change scenarios are implemented (D)	National	Response / benefit
	SP15. Promote appropriate use of emerging technology to support the conservation development and sustainable use of FGR	Trend and number of species subject to biotechnology research and/or applications	National	Response / benefit
	SP16. Develop and reinforce research programmes on tree breeding, domestication and bioprospection in order to unlock the full potential of FGR	1- Change in number of tree geneticists and tree breeders (D) 2- Number of university courses/ training courses offered in forest genetics related subjects (D) 3- Production gain from breeding *vs*. loss from ill-adapted plantations (D)	National	Response / benefit
	SP17. Develop and promote networking and collaboration among concerned countries to combat invasive species (animals, plants and micro-organisms) affecting FGR	1- A relevant network that assesses the impact of invasive species on FGR exists and is maintained over time (I) 2- Trend and number of invasive species affecting forest genetic resources	National	Response / benefit
	SP18. Develop national strategies for *in situ* and *ex situ* conservation of FGR and their sustainable use	1- Policy tools for *in situ* and *ex situ* conservation of FGR in place in each country	National	Response / benefit
Priority area 4: Policies, institutions and capacity-building	SP19. Update FGR conservation and management needs and integrate them into wider policies, programmes and frameworks of action at national, regional and global levels	Relevant FGR assessment parameters are included in National Forest Inventories (NFI) and National Forest Monitoring Programmes (D)	National	Response / benefit

SP20. Develop collaboration and promote coordination of national institutions and programmes related to FGR	Trend in number of national coordination institutions that include FGR and the implementation of the GPA FGR (I)	National	Response / benefit
SP21. Establish and strengthen educational and research capacities on FGR to ensure adequate technical support to related development programmes	1- Change in number of operational tree improvement breeding institutions and laboratories 2- Trend and number of faculties or graduate schools with tree improvement and breeding programmes (D)	National	Response / benefit
SP22. Promote the participation of indigenous and local communities in FGR management in the context of decentralization	Trend in number, proportion and area of community and indigenous managed forests and tree-based production systems	National	Response / benefit (S)
SP23. Promote and apply mechanisms for germplasm exchange at regional level to support research and development activities, in agreement with international conventions	1- Regional regulations and mechanism for forest reproductive material exchange in place. 2- Trends in number and type of seed lots and quantities of seeds traded/exchanged for research and development (D)	Regional	Response / benefit
SP24. Reinforce regional and international cooperation to support education, knowledge dissemination, research, and conservation and sustainable management of FGR	An international network that supports education, knowledge dissemination, research, conservation and sustainable management of FGR exists and is maintained over time (D)	Regional / international	Response / benefit (S)
SP25. Encourage the establishment of network activities and support development and reinforcement of international networking and information sharing on FGR research, management and conservation	1- Trends number of FGR related networks (with activities completed as part of mandates) 2- Trends in lifespan of FGR related networks	Regional / international	Response / benefit
SP26. Promote public and international awareness of the roles and values of FGR	1- Number of courses including FGR at national level (D) 2- Trends in inclusion of FGR consideration in global plans of action of international relevant bodies / conventions / initiatives	International	Response / benefit
SP27. Strengthen efforts to mobilize the necessary resources, including financing, for the conservation, sustainable use and development of FGR	1- Trends in number of funding calls specifically mentioning FGR at national and international levels 2- Trends in level and proportion (in relation to other conservation and use schemes) of funding available for FGR projects at national and international levels	National / Regional / international	Response / benefit

		3- Trends and proportion of SPs being implemented at national level		

Verifiable indicators:

(D): directly related to indicators in Graudal *et al*. (2014)

**: indirectly related to and adapted from existing indicator in Graudal *et al*. (2014)