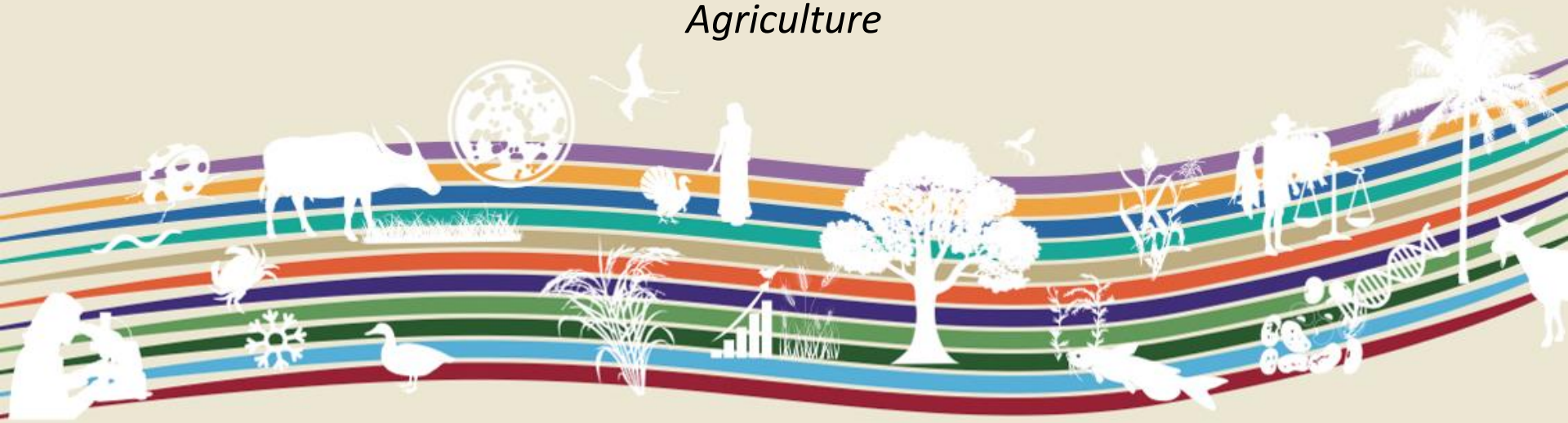
Food and Agriculture Organization of the United Nations

COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

FAO's work on biodiversity for food and agriculture

Irene Hoffmann

Secretary, Commission on Genetic Resources for Food and Agriculture



GenResBridge virtual meeting, 27 October 2020

The Commission on Genetic Resources for Food and Agriculture (CGRFA)

- 178 member countries + EU
- Only permanent **intergovernmental forum** to discuss and negotiate matters relevant to **all components of biodiversity** for food and agriculture
- Vision:
  Conserving biodiversity for food and agriculture and promoting its **use** in support of global food security and sustainable development, for present and future generations

Biodiversity for food and agriculture

is the variety of **micro-organisms, plants and animals** at the **genetic, species and ecosystem** levels that sustain the functions, structure and processes of agricultural production systems.

- Genetic resources (domesticated)
- Wild foods
- Associated biodiversity: Regulating and supporting ecosystem services to agriculture

On 19 October 2020, the EU Agriculture and Fisheries Council agreed on conclusions regarding the EU Farm to Fork Strategy.

(23) CALLS ON the Commission to take concrete actions for ensuring the protection, restoration and sustainable use of plant and animal genetic resources. **INVITES the Commission to present a EU strategy for genetic resources for aquaculture, forests and agriculture that** is based on the work of the Commission on Genetic Resources for Food and Agriculture of the FAO. As a result, primary producers should benefit from easier market access to cultural, climate and locally adapted varieties and breeds. WELCOMES, in this context, the Commission's objective of facilitating the registration of seed varieties, including varieties used for organic farming.

On 23 October 2020, the EU Environment Council agreed on conclusions regarding the EU Biodiversity Strategy for 2030.

43. RECALLS the commitments and efforts made within the Commission on Genetic Resources for Food and Agriculture of the United Nations' Food and Agriculture Organisation to implement the principles of conservation and sustainable development, particularly in relation to animal, aquatic, plant and forest genetic resources, as well as emerging thematic areas including microorganisms, invertebrates, nutrition and health; and **ASSERTS the importance of close and constant cooperation with this forum with the aim of achieving common goals, utilising resources efficiently and avoiding duplication;**

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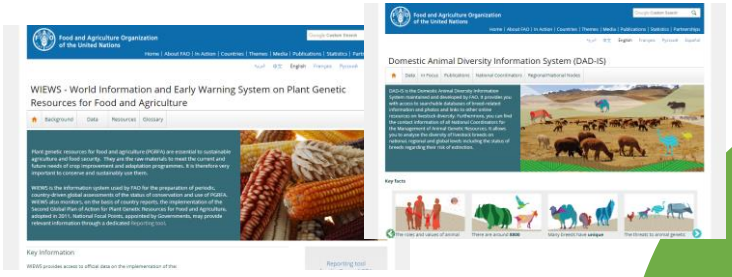
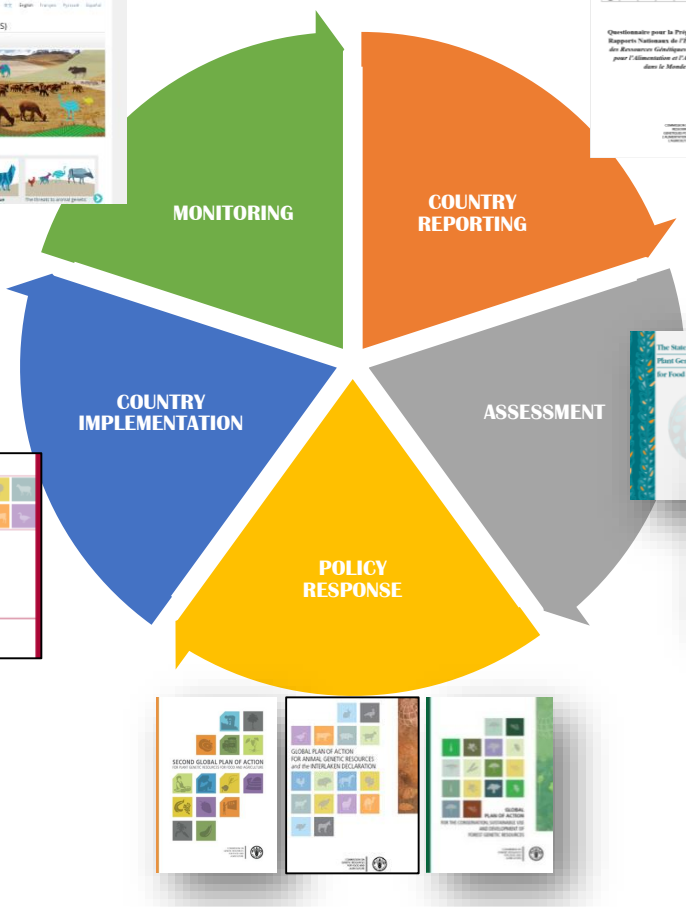
Commission's cycle of work



90-169 country reports / SOW



Development of new global assessments

PGR

- SOW-PGR-3 to be presented to CGRFA-19 in 2023

FGR

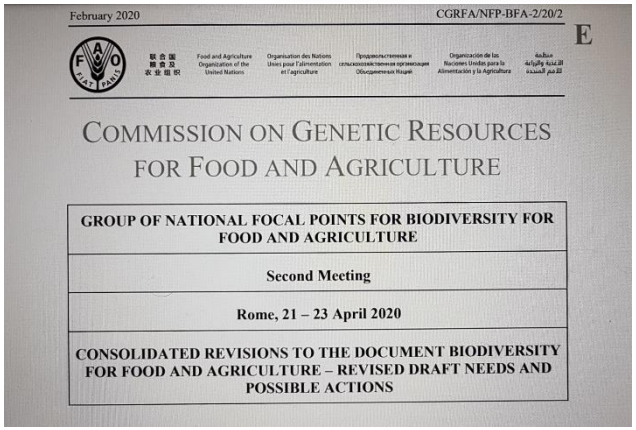
- 2nd GPA-FGR Implementation Report
- SoW-FGR-2 to be presented to CGRFA-19 in 2023
- Regional workshops

Development of new policy responses

Needs and possible actions on BFA

- 2nd open-ended NFP-BFA workshop
- Revised draft to CGRFA-18 for approval
- Adoption by FAO Council / Conference as GPA-BFA

Input for CBD COP-15


February 2020 CGRFA/NFP-BFA-2/20/2 E

COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

GROUP OF NATIONAL FOCAL POINTS FOR BIODIVERSITY FOR FOOD AND AGRICULTURE

Second Meeting

Rome, 21 – 23 April 2020

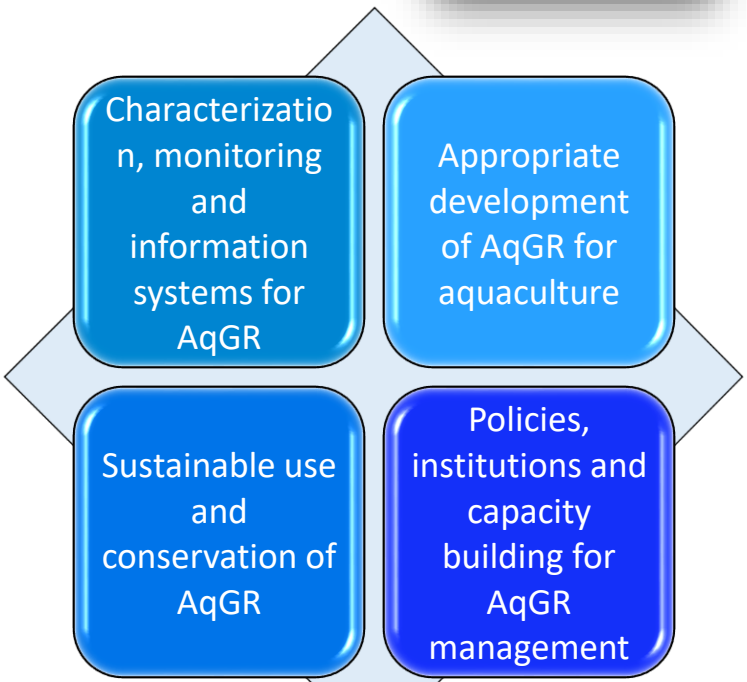
CONSOLIDATED REVISIONS TO THE DOCUMENT BIODIVERSITY FOR FOOD AND AGRICULTURE – REVISED DRAFT NEEDS AND POSSIBLE ACTIONS

http://www.fao.org/cgrfa/meetings/detail/en/c/1257654/

Development of new policy responses

GPA-AqGR

- Regional consultations
- Draft GPA to ITWG-AqGR for review
- Final draft to CGRFA-18 for approval
- Adoption by FAO Council / Conference



Cross-sectoral work at CGRFA-18

Microbe and invertebrate GRFA: pollinators, biological control agents

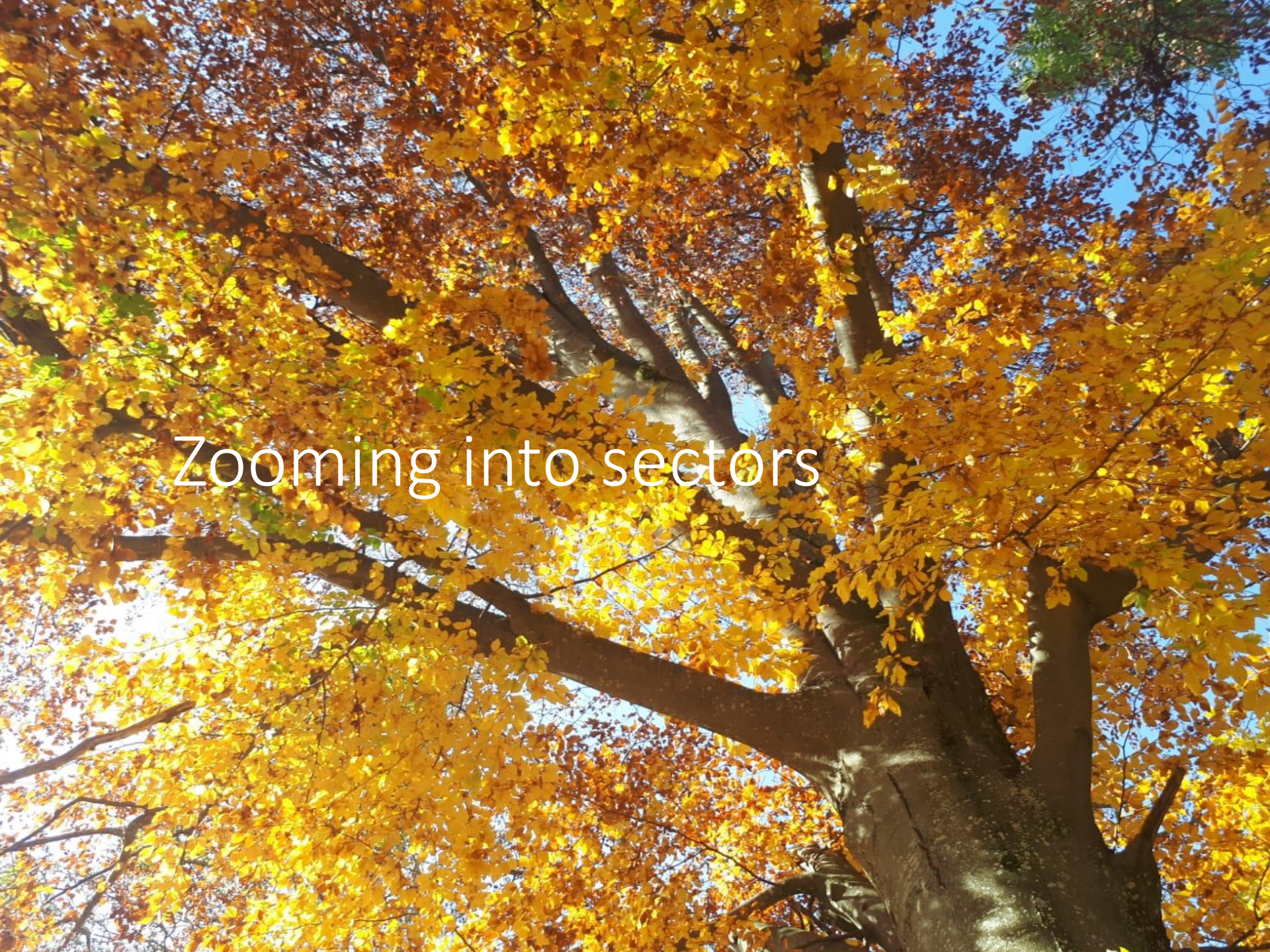
Climate change: work plan

ABS

DSI

Biotechnology

Concept note on GRFA and **Human health**


Zooming into sectors

Genetic Resources

REVIEW

Genetic Resources (2020), 1 (1) 4–16
DOI: 10.46265/genresj.2020.1.4-16
https://www.genresj.org
ISSN: 2708-3764

Global status of genetic resources for food and agriculture: challenges and research needs

Dafydd Pilling, Julie Bélanger *, Stefano Diulgheroff, Jarkko Koskela, Grégoire Leroy, Graham Mair and Irene Hoffmann

Food and Agriculture Organization of the United Nations (FAO), Rome, Italy

Abstract: Plant, animal, forest, aquatic, micro-organism and invertebrate genetic resources are vital to food security, nutrition, livelihoods and the resilience and adaptability of global agricultural production systems. Despite increasing efforts in recent years, much remains to be done to improve the management of these resources. Many are at risk of extinction or erosion and many have been overlooked in terms of use and development. There is an urgent need to address these deficiencies, both within the individual sectors of food and agriculture and in terms of how genetic resources management can be better integrated across sectors. These efforts will need to include action to address the multiple knowledge gaps that constrain improvements to management. They will also need to include the creation of policy and institutional frameworks that promote collaboration and stakeholder participation and allow sustainable management strategies to be implemented effectively at appropriate scales.

Keywords: genetic resources, food and agriculture, Sustainable Development Goals, global assessments, knowledge gaps

Citation: Pilling, D., Bélanger, J., Diulgheroff, S., Koskela, J., Leroy, G., Mair, G., Hoffmann, I. (2020). Global status of genetic resources for food and agriculture: challenges and research needs. *Genetic Resources* 1 (1), 4-16. doi: 10.46265/genresj.2020.1.4-16.

Monitoring the implementation of the GPA for AnGR

SDG Indicators 2.5.1b and 2.5.2

Response indicators

Synthesis report on GPA implementation process based on standard questionnaire - every 5 years

- 76 multiple-choice questions with opportunity to include explanatory narrative text
- Responses are assigned a value of 0, 1 or 2 where higher values indicate greater implementation
- Indicators are calculated for SPA and SP by averaging scores

GPA Implementation by Strategic Priority Area

	Characterization and monitoring	Sustainable use	Conservation	Policies and capacity building	Collaboration	Funding
Global	1.16	1.08	0.92	1.16	0.76	0.59
Europe 2019	1.53	1.43	1.35	1.49	1.08	0.60
Europe 2014	1.48	1.31	1.29	1.43	1.03	0.54
Best region	1.82	1.53	1.77	1.77	1.25	0.83
Worst region	0.58	0.37	0.43	0.54	0.31	0.33

Indicators for GPA strategic priority areas, collaboration and funding – comparing 2014 and 2019 reports (0=no or low level of implementation, 2= high level of implementation)

Europe and the Caucasus reported in general an higher level of implementation of the GPA, when compared to other regions, with limited progress over time

State indicators

- calculated based on data in DAD-IS, entered by NCs
- SDG Indicators 2.5.1b and 2.5.2 based on more than 8000 breeds
- Agregatable at all levels

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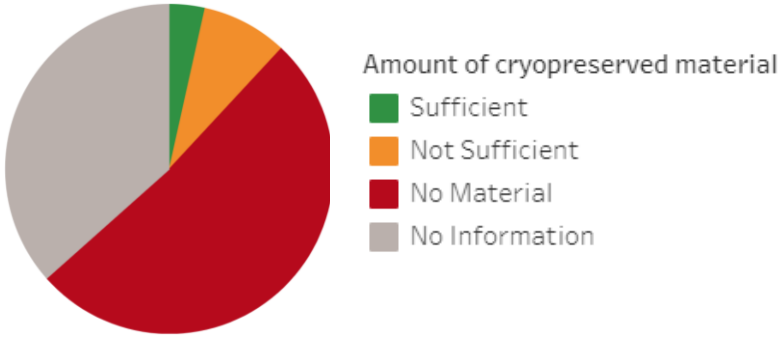
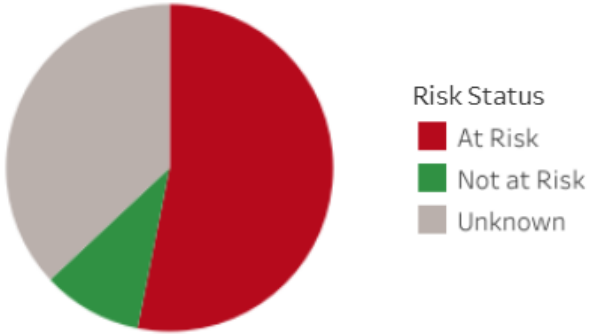
SDG indicators 2.5.1b and 2.5.2 for Europe and the Caucasus

SDG 2.5.1b Number of local breeds secured in either medium of long term conservation facilities



- Cryopreservation status known for two thirds of local breeds
- 133 local breeds with sufficient material to allow reconstitution in case of extinction (3.5%)

SDG 2.5.2 Percentage of local breeds at risk of extinction out of which of known status



- Risk status known for two thirds of local breeds
- Out of these, around 85% are at risk of extinction

AnGr policies, strategies at European level

- In Europe and Caucasus, 90% countries indicate having national policies and legal frameworks for AnGR management

- Diversity of measure undertaken: e.g. 68% of breeds receiving subsidies in Europe showed positive demographic trends over time (2007-2018), versus only about 51% of the breeds that did not receive such subsidies (Gicquel et al. 2019).

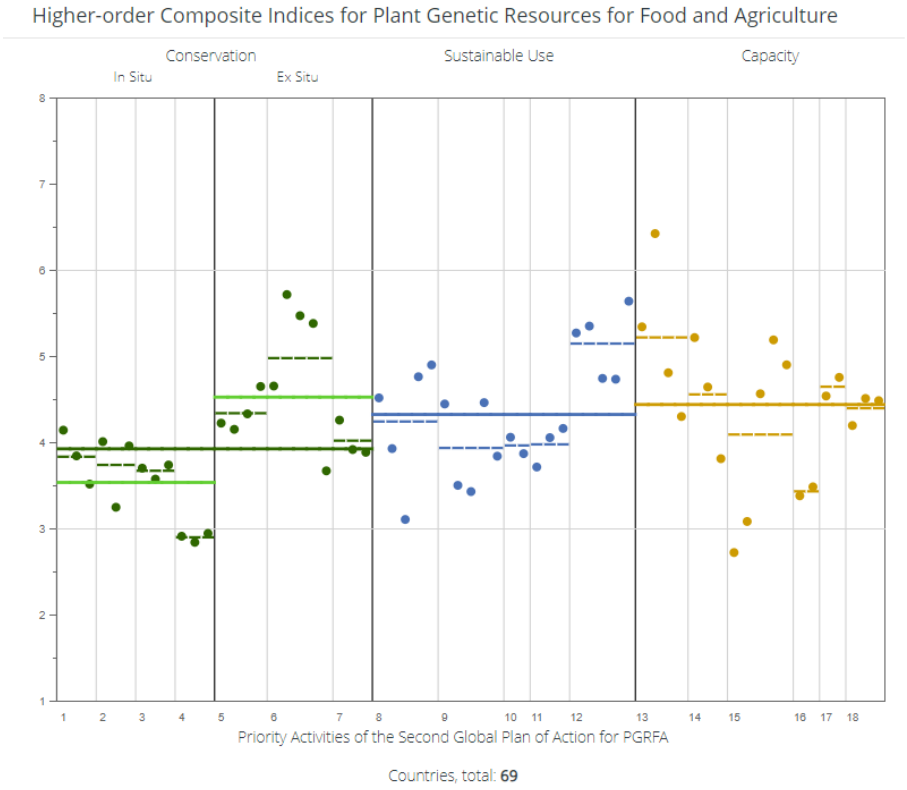

Monitoring the implementation of the 2nd GPA for PGR
SDG 2.5.1a

Response indicators

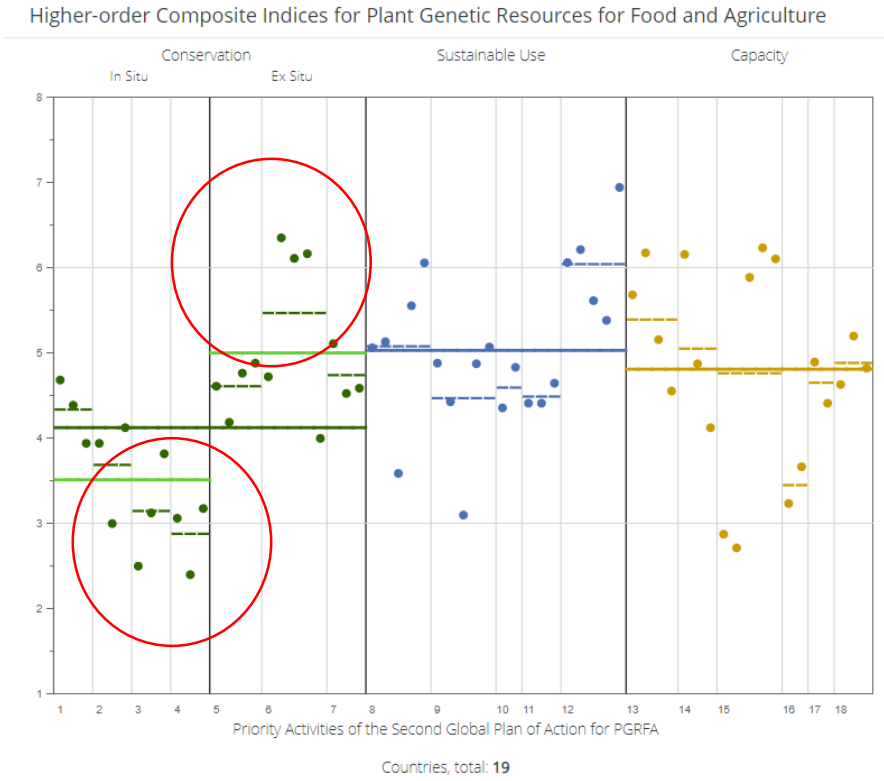
Report on Implementation process based on standard questionnaire

- Three Targets for plant genetic resources for food and agriculture (Conservation; Sustainable use; Institutional and human capacities) through three Higher-order Composite Indices; and
- 18 Priority Activities of the Second Global Plan of Action through 63 indicators in 2014 and 58 indicators in 2019.

Higher-order Composite Indices for Plant Genetic Resources for Food and Agriculture (2012-14)



World



Europe

http://www.fao.org/wiews/en/

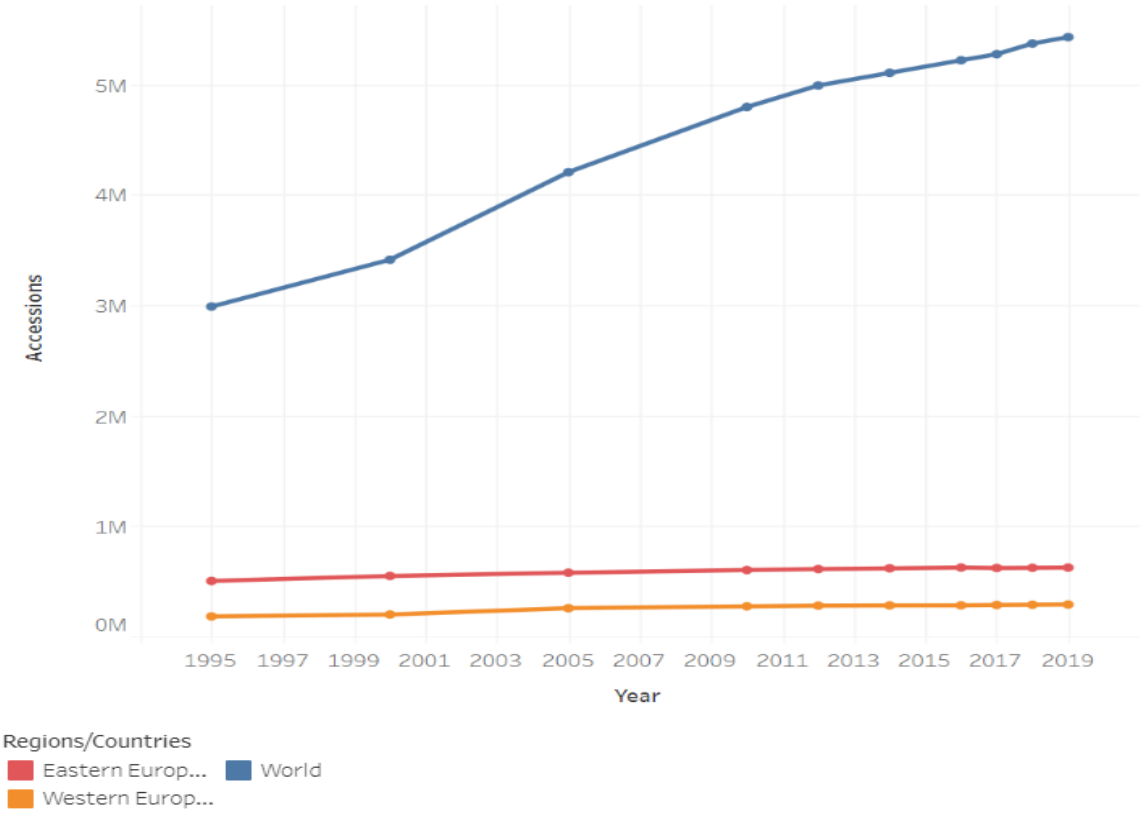
State indicators

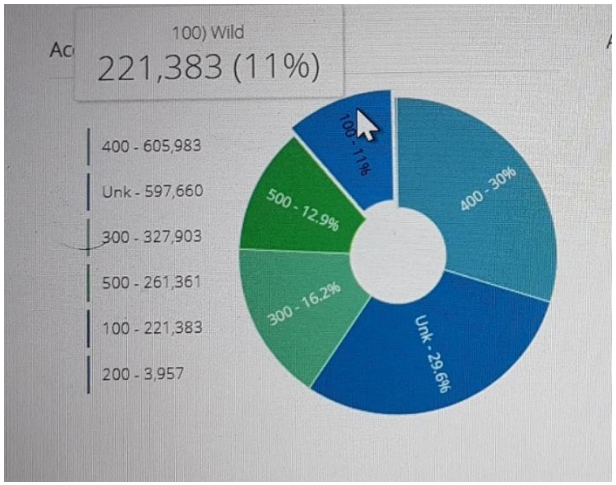
http://www.fao.org/wiews/data/domains/monitoring-framework/en/

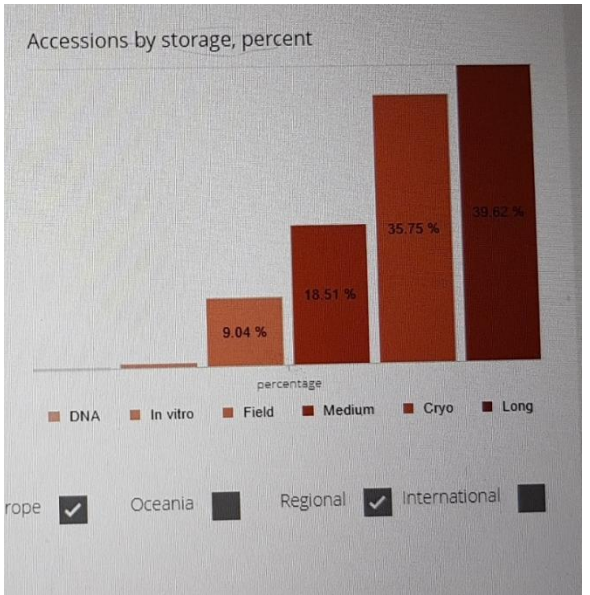
Included in above set of indicators and SDG 2.5.1.

SDG 2.5.1a Number of plant genetic resources for food and agriculture secured in either medium or long term conservation facilities

SDG 2.5.1a


5M
4M
3M
2M
1M
0M
Accessions
1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017 2019
Year
Regions/Countries
Eastern Europ...
World
Western Europ...

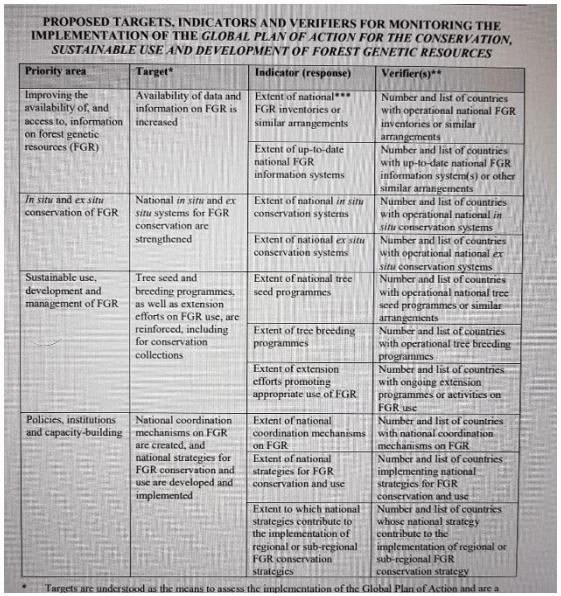

100) Wild
221,383 (11%)
400 - 605,983
Unk - 597,660
300 - 327,903
500 - 261,361
100 - 221,383
200 - 3,957
100 - 11%
400 - 30%
500 - 12.9%
300 - 16.2%
Unk - 29.6%


Accessions by storage, percent
9.04 %
18.51 %
35.75 %
39.62 %
percentage
DNA
In vitro
Field
Medium
Cryo
Long
Oceania
Regional
International

Monitoring the implementation of the GPA on FGR

Response indicators

- Report on country implementation based on standard questionnaire
- 4 priority areas
- Countries can report progress by indicating the degree to which targets are achieved on a Likert-type scale



PROPOSED TARGETS, INDICATORS AND VERIFIERS FOR MONITORING THE IMPLEMENTATION OF THE *GLOBAL PLAN OF ACTION FOR THE CONSERVATION, SUSTAINABLE USE AND DEVELOPMENT OF FOREST GENETIC RESOURCES*

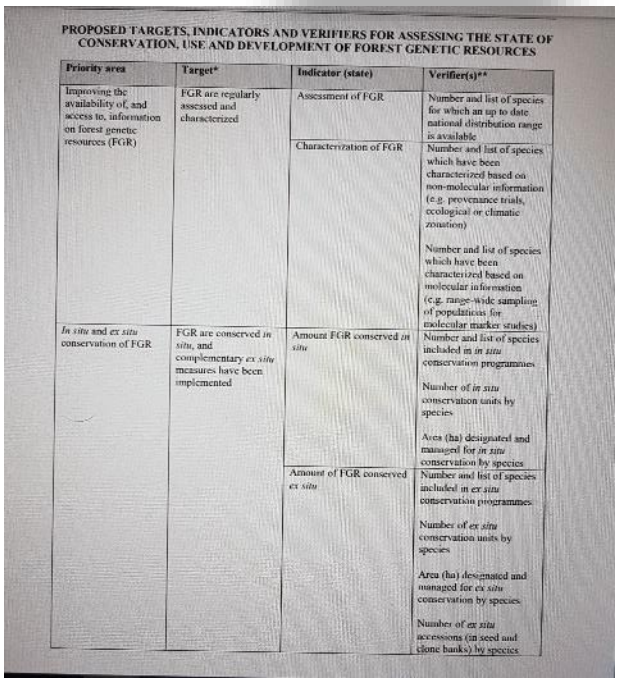
Priority area	Target*	Indicator (response)	Verifier(s)**
Improving the availability of, and access to, information on forest genetic resources (FGR)	Availability of data and information on FGR is increased	Extent of national*** FGR inventories or similar arrangements	Number and list of countries with operational national FGR inventories or similar arrangements
		Extent of up-to-date national FGR information systems	Number and list of countries with up-to-date national FGR information system(s) or other similar arrangements
In situ and *ex situ* conservation of FGR	National *in situ* and *ex situ* systems for FGR conservation are strengthened	Extent of national *in situ* conservation systems	Number and list of countries with operational national *in situ* conservation systems
		Extent of national *ex situ* conservation systems	Number and list of countries with operational national *ex situ* conservation systems
Sustainable use, development and management of FGR	Tree seed and breeding programmes, as well as extension efforts on FGR use, are reinforced, including for conservation collections	Extent of national tree seed programmes	Number and list of countries with operational national tree seed programmes or similar arrangements
		Extent of tree breeding programmes	Number and list of countries with operational tree breeding programmes
		Extent of extension efforts promoting appropriate use of FGR	Number and list of countries with ongoing extension programmes or activities on FGR use
Policies, institutions and capacity-building	National coordination mechanisms on FGR are created, and national strategies for FGR conservation and use are developed and implemented	Extent of national coordination mechanisms on FGR	Number and list of countries with national coordination mechanisms on FGR
		Extent of national strategies for FGR conservation and use	Number and list of countries implementing national strategies for FGR conservation and use
		Extent to which national strategies contribute to the implementation of regional or sub-regional FGR conservation strategies	Number and list of countries whose national strategy contribute to the implementation of regional or sub-regional FGR conservation strategy

* Targets are understood as the means to assess the implementation of the Global Plan of Action and are a

CGRFA-16/17/20

State indicators

5 priority areas with 10 indicators focussing on the state of conservation, use and development of forest genetic resources.



PROPOSED TARGETS, INDICATORS AND VERIFIERS FOR ASSESSING THE STATE OF CONSERVATION, USE AND DEVELOPMENT OF FOREST GENETIC RESOURCES

Priority area	Target*	Indicator (state)	Verifier(s)**
Improving the availability of, and access to, information on forest genetic resources (FGR)	FGR are regularly assessed and characterized	Assessment of FGR	Number and list of species for which an up to date national distribution range is available
		Characterization of FGR	Number and list of species which have been characterized based on non-molecular information (e.g. provenance trials, ecological or climatic zonation) Number and list of species which have been characterized based on molecular information (e.g. range-wide sampling of populations for molecular marker studies)
In situ and *ex situ* conservation of FGR	FGR are conserved *in situ*, and complementary *ex situ* measures have been implemented	Amount FGR conserved *in situ*	Number and list of species included in *in situ* conservation programmes Number of *in situ* conservation units by species Area (ha) designated and managed for *in situ* conservation by species
		Amount of FGR conserved *ex situ*	Number and list of species included in *ex situ* conservation programmes Number of *ex situ* conservation units by species Area (ha) designated and managed for *ex situ* conservation by species. Number of *ex situ* accessions (in seed and clone banks) by species

1st implementation Report

- Limited number of reports (44 countries - 23 from Europe + Caucasus) do not allow making comprehensive conclusions.
- The situation is relatively good in many of the reporting countries in terms of having various mechanisms, programmes and strategies on forest genetic resources in place.
- Species-specific data and information remain a challenge - a total of 1145 tree and other woody plant species (including hybrids) were included in the country progress reports.

Findings

EU Members commitment to implement GPAs

Response indicators

- High levels of achievement in implementing the GPAs – but little increase over time
- Many polices and incentives, sometimes contradictory

Data

- Lack of data and information
- Incomplete reporting
- Political sensitivities about data

State indicators

- Vary between sectors, e.g. in-situ conservation (AnGR, PGR) considered low
- Livelihoods are important

EU Status reports

EU Auditors report on CAP and farmland biodiversity

- https://www.face.eu/2020/06/eu-auditors-report-on-cap-and-farmland-biodiversity-published/

EEA: The European environment - state and outlook 2020. Knowledge for transition to a sustainable Europe

- https://www.eea.europa.eu/publications/soer-2020

- Convergence – SOW-BFA, IPBES

Conclusions

- EU first comprehensive holistic strategies on biodiversity and GRFA – opportunity for Europe
- Support international agreements of CGRFA, CBD and Treaty
- CGRFA develops GRFA policies, tools and monitoring systems – strengthen synergies
- Improve monitoring and reporting, support NFPs
- Synergies with other processes e.g. SDG 2.4.1.; 14, 15,
- *In situ*: Integrated landscape + multi-stakeholder + rural development approach - much local GRFA and BFA are in marginal areas/HNV - livelihood of custodians
- Link Biodiversity and F2F strategies strongly with CAP

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Commission on Genetic Resources for Food and Agriculture: http://www.fao.org/cgrfa/