



## AFRICAN COMMISSION ON AGRICULTURAL STATISTICS

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### SDG INDICATOR 2.5.1 “NUMBER OF PLANT AND ANIMAL GENETIC RESOURCES FOR FOOD AND AGRICULTURE SECURED IN EITHER MEDIUM OR LONG-TERM CONSERVATION FACILITIES”

#### I. Introduction

The conservation of plant and animal genetic resources for food and agriculture (GRFA) in medium or long term conservation facilities (ex situ in genebanks) represents the most trusted means of conserving genetic resources worldwide. Plant and animal GRFA conserved in these facilities can be easily used in breeding programmes as well, even directly on-farm.

#### II. Methodology

##### a. Rationale for the SDG Indicator 2.5.1

Genetic resources for food and agriculture provide the building blocks of food security and, directly or indirectly, support the livelihoods of every person on earth. As the conservation and accessibility to these resources is of vital importance, medium or long term conservation facilities (genebanks) to preserve and make accessible these resources and its associated information for breeding and research have been established at country, regional and global levels. Inventories of genebank holdings provide a dynamic measure of the existing plant and animal diversity and its level of preservation. Data relevant to this indicator facilitate the monitoring of diversity secured and accessible through genebanks and support the development and updating of strategies for the conservation and sustainable use of genetic resources.

##### b. Components of the indicator

The two components of the indicator, plant and animal GRFA, are separately counted.

Plant genetic resources: The plant component is calculated as the number of accessions of plant genetic resources secured in conservation facilities under medium or long term conditions, where an 'accession' is defined as a distinct sample of seeds, planting materials or plants which is maintained in a genebank. Genebank Standards for Plant Genetic Resources for Food and Agriculture (accessible at <http://www.fao.org/documents/card/en/c/7b79ee93-0f3c-5f58-9adc-5d4ef063f9c7/>), set the benchmark for current scientific and technical best practices for conserving plant genetic resources, and support key international policy instruments for the conservation and use of plant genetic resources. These voluntary standards have been endorsed by the FAO Commission on Genetic Resources for Food and Agriculture at its Fourteenth Regular Session (<http://www.fao.org/docrep/meeting/028/mg538e.pdf>).

Animal genetic resources: The animal component is calculated as the number of local breeds stored within a genebank collection with an amount of genetic material stored which is required to reconstitute the breed (based on the Guidelines on Cryconservation of Animal Genetic Resources, FAO, 2012, accessible at <http://www.fao.org/docrep/016/i3017e/i3017e00.htm>). The guidelines have been endorsed by the Commission on Genetic Resources for Food and Agriculture at its Thirteenth Regular Session (<http://www.fao.org/docrep/meeting/024/mc192e.pdf>).

### **c. Computation method**

#### Plant Genetic Resources

The plant component of the indicator is calculated as the total number of unique accessions of plant genetic resources secured in medium to long term conservation facilities. This should include all the accessions in base collections, and unique accessions stored in medium term conservation facilities, as active collections, only when these accessions should be considered to become part of the national base collections.

#### Animal Genetic Resources

For the animal component the indicator is calculated as the number of local breeds stored within a genebank collection with an amount of genetic material stored which is required to reconstitute the breed (based on the Guidelines on Cryconservation of animal genetic resources, FAO, 2012, <http://www.fao.org/docrep/016/i3017e/i3017e00.htm>).

### **d. Interpretation**

The number of materials conserved under medium or long term storage conditions provides an indirect measurement of the total genetic diversity which we are managing to secure for future use. Overall, positive variations are therefore approximated to an increase in the agro-biodiversity secured, while negative variations to a loss of it.

Caution needs to be paid in interpreting the indicator. In the case of plant genetic resources, an uncontrolled addition of accessions which in fact are duplicates of samples already conserved and accounted for, or, vice versa, the deletion from the reported collections of redundant duplicates may lead to wrong interpretations. Another example that needs to be monitored both while reporting and interpreting the results include the grouping or splitting of accessions, as in both cases the variation in the accounted number does not reflect a variation in the genetic diversity conserved and secured. Therefore, it is crucial that reporting countries and stakeholders together with the accession level information requested explain also the reason for the decrease or increase in the number of accessions when this does not reflect a real loss or gain in the genetic diversity conserved and secured.

#### **e. Treatment of missing values**

For both components, plants and animals, missing values are treated as such and not replaced by estimates.

#### **f. Regional aggregates**

For both components, plants and animals, aggregates are the sum of country values.

#### **g. Sources of discrepancies**

The indicator is related to a monitoring framework endorsed by the FAO Commission on Genetic Resources for Food and Agriculture in which the status and trends of plant and animal genetic resources are described through globally agreed indicators and regular country-driven assessments. Officially appointed National Focal Points / National Coordinators report directly to FAO, using a format agreed by the Commission on Genetic Resources for Food and Agriculture. Since FAO does not alter those data, there should be no difference between data reported by FAO and national figures.

#### **h. Quality assurance**

Not applicable.

#### **i. Limitations**

Plant genetic resources

Broadly, two issues are of concern in using the “number of accessions” as an indicator of diversity in ex situ collections:

Undetected duplicates of accessions may contribute to an increase of the indicator, as each accession is a managed unit, kept and recorded as distinct. The detection of such duplicates will therefore result in a reduction in the number of accession previously reported. This can occur at different levels, for example within genebank collections and also at international level.

A loss of viability of the material(s) conserved that is not promptly detected may as well not be reflected in the number of accessions, contributing to an overestimate of the actual number of accessions.

Additional information could be provided by other indicators measuring ex situ conservation, which are part of the monitoring of the Global Plan of Action for PGRFA.

Animal genetic resources

To collect data on a regular base the Domestic Animal Diversity Information System DAD-IS needs to be amended.

### III. Data sources

#### a. Description

Plant genetic resources

Country data are stored in the World Information and Early Warning System for plant genetic resources for food and agriculture (WIEWS), the FAO information system established to facilitate information exchange as well as periodic assessments of the state of the world's plant genetic resources for food and agriculture.

Officially appointed National Focal Points (NFPs) (see <http://www.fao.org/agriculture/crops/thematic-sitemap/theme/seeds-pgr/gpa/national-focal->

points/en/) report directly to FAO through the WIEWS Reporting System, according to the Reporting Format for monitoring the implementation of the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture (CGRFA-15/15/Inf.9, accessible at <http://www.fao.org/3/a-mm294e.pdf>), which is based on the 63 indicators agreed by the Commission on Genetic Resources for Food and Agriculture (CGRFA-15/15/Report, Appendix C). One of those indicators is 'Number of accessions conserved ex situ under medium or long-term conditions' (Indicator 20). Data on this indicator is sourced from published information systems which comply with the standard of the FAO/Bioversity Multi-crop Passport Descriptor List (MCPD) v. 2 (see References), i.e. EURISCO (<http://eurisco.ipk-gatersleben.de/>) and Genesys (<https://www.genesys-pgr.org>). Besides NFP, regional and international agricultural research centres holding PGRFA ex situ collections also provide information on those collections.

The frequency of data reporting is decided by the Commission on Genetic Resources for Food and Agriculture in the framework of the monitoring of the Global Plan of Action for Plant Genetic Resources for Food and Agriculture and the preparation of the periodic assessment of the State of the World's plant genetic resources for food and agriculture. It could be complemented by annual reporting on this specific indicator.

For the indicator, countries are requested to provide the name of the genebank (or holding institute code), the accession number and the scientific name of the accession (name of taxon, including genus, species and lower taxonomic ranking). Optionally, information on several other descriptors is provided (see Reporting Format for the list of descriptors). This allows to analyse changes in different types of diversity concerned, including changes in the type and origin of the material secured (e.g. biological status; country of origin; locations of safety duplications; etc.) and better describe the composition of the secured materials. The indicator applies the FAO/Bioversity Multi-Crop Passport Descriptor (MCPD) v. 2, an international standard for PGRFA information exchange.

Animal genetic resources:

National Coordinators for Management of Animal Genetic Resources, nominated by their respective government, provide data to the Domestic Animal Diversity Information System (DAD-IS) (<http://dad.fao.org/>). DAD-IS could be amended to collect the required information. Currently a project for DAD-IS development is ongoing. The updated version of DAD-IS will allow countries the storage of data on animal genetic resources being secured in either medium or long term conservation facilities as needed for the indicator.

## **b. Collection process**

The indicator is related to a monitoring framework endorsed by the FAO Commission on Genetic Resources for Food and Agriculture in which the status and trends of plant and animal genetic resources are described through globally agreed indicators and regular country-driven assessments. Officially appointed National Focal Points / National Coordinators report directly to FAO, using a format agreed by the Commission on Genetic Resources for Food and Agriculture.

Sessions of the intergovernmental technical working group on plant and on animal genetic resources for food and agriculture allow for formal consultation processes.

## **IV. Conclusion**

### **Plant genetic resources**

The most recent data collected for the implementation of the Second Global Plan of Action for PGRFA will serve as baseline (number of accessions as of June 2014).

As of March 2016, data on about 3.6 million accessions were gathered from 71 countries and 12 international centres. The data collection is ongoing and expected to be finalized by December 2017. Efforts are made to improve the coverage of countries.

### **Animal genetic resources**

The analysis of country reports to FAO provided by 128 countries for the preparation of ‘The Second Report on the State of the World’s Animal Genetic Resources for Food and Agriculture’ provides a first baseline with regard to the number of national breed populations where sufficient material is stored.

The data information systems WIEWS and DAD-IS allow countries to update the relevant information on a regular base.