



## LEARNING ABOUT 2 5.1 5.2 INDICATORS

SDG Indicators 2.5.1 and 2.5.2 – Plant and animal genetic resources

### Lesson 3: Monitoring plant genetic resources in genebanks

#### Text-only version

The interactive version of this lesson is available free of charge at: <https://elearning.fao.org>



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Food and Agriculture  
Organization of the  
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working for Zero Hunger

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This lesson describes the role and tasks of the National Focal Points for plant genetic resources. It illustrates the two methods they can use to report data for the plant component of SDG Indicator 2.5.1 to FAO.

## Learning objectives

At the end of this lesson, you will be able to:

- illustrate the main steps that countries have taken for the conservation and sustainable use of plant genetic resources;
- define the role and tasks of National Focal Points for Plant Genetic Resources;
- describe the two methods to report to FAO on the plant component of the SDG Indicator 2.5.1.

## Main international agreements on plant genetic resources for food and agriculture

Plant genetic resources have been on the international agenda for some time and over the last 20 years, important steps have been taken to conserve and use them on a sustainable basis.

### 1996 First Global Plan of Action

A **Global Plan of Action on Conservation and Sustainable Use of Plant Genetic Resources for Food and Agriculture** is adopted by 150 countries.

### 1996 International Treaty

The **International Treaty on Plant Genetic Resources for Food and Agriculture**, a legally binding agreement for the conservation, exchange and sustainable use of crop diversity, is adopted.



See Lesson 2 for more information on the International Treaty.

### 1996 Second Global Plan of Action

The **Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture**, negotiated by the **FAO Commission on Genetic Resources for Food and Agriculture**, is adopted.



### FAO Commission on Genetic Resources for Food and Agriculture

The FAO Commission on Genetic Resources for Food and Agriculture aims to reach international consensus on **policies for the sustainable use and conservation of genetic resources for food and agriculture** and the fair and equitable sharing of benefits derived from their use. It is an intergovernmental forum, **established in 1983**. The Commission oversees global assessments of the state of the world's forest, plant, aquatic and animal genetic resources for food and agriculture, as well as biodiversity for food and agriculture. It has **negotiated** major international instruments, including the **International Treaty on Plant Genetic Resources for Food and Agriculture** (see *Lesson 2 for more information on the International Treaty*).

As of January 2018, the Commission has 178 member countries and the European Union. [www.fao.org/cgrfa/en/](http://www.fao.org/cgrfa/en/)

The Second Global Plan of Action is **an internationally agreed framework of 18 priority activities** for the conservation and sustainable use of plant genetic resources for food and agriculture. These 18 priority activities are divided into **four thematic areas**:

<b><i>In situ</i> conservation and management</b>	<p>The thematic area <i>In situ conservation and management</i> includes four Priority Activities:</p> <ol style="list-style-type: none"> <li>1. <b>Surveying and inventorying</b> plant genetic resources for food and agriculture;</li> <li>2. <b>Supporting on-farm management and improvement</b> of plant genetic resources for food and agriculture;</li> <li>3. Assisting farmers in disaster situations to <b>restore crop systems</b>; and</li> <li>4. Promoting <i>in situ</i> <b>conservation and management of crop wild relatives and wild food plants</b>.</li> </ol>
<b><i>Ex situ</i> conservation</b>	<p>The thematic area <i>Ex situ conservation and management</i> includes three Priority Activities:</p> <ol style="list-style-type: none"> <li>5. Supporting <b>targeted collecting</b> of plant genetic resources for food and agriculture;</li> <li>6. Sustaining and expanding <i>ex situ</i> <b>conservation of germplasm</b>; and</li> <li>7. <b>Regenerating and multiplying</b> <i>ex situ</i> accessions.</li> </ol> <p>The plant component of Sustainable Development Goal Indicator 2.5.1 is addressed under Priority Activity number 6.</p>

<b>Sustainable use</b>	<p>The thematic area <i>Sustainable use</i>, includes five Priority Activities:</p> <p>8. Expanding the <b>characterization, evaluation</b> and further development of specific subsets of collections to facilitate use;</p> <p>9. Supporting <b>plant breeding, genetic enhancement and base-broadening</b> efforts;</p> <p>10. Promoting <b>diversification of crop production and broadening crop diversity</b> for sustainable agriculture;</p> <p>11. Promoting <b>development and commercialization of all varieties</b>, primarily farmers' varieties/landraces and underutilized species; and</p> <p>12. Supporting <b>seed production and distribution</b>.</p>
<b>Building sustainable institutional and human capacities</b>	<p>The thematic area <i>Building sustainable institutional and human capacities</i> includes six Priority Activities:</p> <p>13. Building and strengthening <b>national programmes</b>;</p> <p>14. Promoting and strengthening <b>networks</b> for plant genetic resources for food and agriculture;</p> <p>15. Constructing and strengthening comprehensive <b>information systems</b> for plant genetic resources for food and agriculture;</p> <p>16. Developing and strengthening <b>systems for monitoring and safeguarding genetic diversity and minimizing genetic erosion</b> of plant genetic resources for food and agriculture;</p> <p>17. Building and strengthening <b>human resource capacity</b>;</p> <p>18. Promoting and strengthening <b>public awareness</b> of the importance of plant genetic resources for food and agriculture.</p>

## The National Focal Points for Plant Genetic Resources

To liaise with countries on matters relevant to plant genetic resources, FAO has invited member countries to designate a National Focal Point who reports to the Organization.

We met one of them, Asha. Let's ask her to describe her role and duties.

**Asha:** “As the appointed **National Focal Point on Plant Genetic Resources** to the FAO Commission on Genetic Resources for Food and Agriculture, I am responsible for **reporting on national implementation of the Second Global Plan of Action** for Plant Genetic Resources for Food and Agriculture, as well as on the plant component of **Sustainable Development Goal Indicator 2.5.1**.

*I also coordinate the preparation of **periodic assessments** on the state of conservation and use of plant genetic resources in my country.*

*In particular, my role encompasses:*

- ***liaising** and consulting with national stakeholders;*
- ***identifying** national **gaps and needs** for the conservation and sustainable use of plant genetic resources for food and agriculture; and*
- *representing the country's interests in **intergovernmental negotiations**.*

*In my country, I am also in charge of **developing and coordinating relevant policies and strategies** for the conservation and sustainable use of plant genetic resources.”*

## Reporting on national implementation of the Second Global Plan of Action

**Asha:** “*Every two/three years, I report to FAO on national implementation of the **Second Global Plan of Action** for Plant Genetic Resources for Food and Agriculture.*”

### Reporting process for the Second Global Plan of Action

Implementation of the 18 priority activities of the Second Global Plan of Action is monitored through **63 indicators**. The National Focal Point has to record the data related to his/her country into the **World Information and Early System on Plant Genetic Resources for Food and Agriculture (WIEWS)** through the **Second Global Plan of Action reporting tool**. The information needed to calculate the indicators is collected through **51 questions** using this tool.

### The National Focal Point:

**STEP 1** - Collects data from **national stakeholders**.

**STEP 2** - Answers the 51 questions of the Second Global Plan of Action reporting tool.



### National stakeholders to collect data on plant genetic resources

National stakeholders to be contacted for data collection on the Second Global Plan of Action may include:

- Government units under the Ministries of Agriculture or Environment, including national or institutional genebanks, seed certification authorities, and plant variety protection offices;
- Agricultural research institutes and universities;
- Associations of breeders and farmers; and

- The national statistics office

### **The World Information and Early Warning System on Plant Genetic Resources for Food and Agriculture**

The World Information and Early Warning System on Plant Genetic Resources for Food and Agriculture (WIEWS) is a database and information system managed by FAO.

The information in WIEWS comes from official data reported on the Global Plans of Action and Sustainable Development Goal Indicator 2.5.1. WIEWS allows visitors to view and download the information, as well as to generate statistics and graphs. It currently includes data on:

- about 4.9 million accessions from over 6 800 genera conserved under medium- or long-term conditions;
- over 570 genebanks from 90 countries and 16 international or regional centres;
- about 18 000 national, regional and international organizations dealing with the conservation and sustainable use of these resources;
- more than 20 000 cultivars; and
- more than 19 000 publications.

## **Reporting on the plant component of Indicator 2.5.1**

**Asha:** *“Each year, by the end of January, I report to FAO on the plant component of Indicator 2.5.1. that monitors SDG Target 2.5.”*



### **SDG Target 2.5 and its indicators**

SDG Target 2.5 consists of two parts. The first part covers the genetic diversity of plants and animals for agriculture. It is monitored through Indicator 2.5.1. and Indicator 2.5.2. The second part covers access to these genetic resources. It is monitored by Indicator 15.6.1.

### **Target 2.5**

By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels and

promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed.

**Indicator 2.5.1:** number of plant and animal genetic resources for food and agriculture secured in either medium- or long-term conservation facilities.

**Indicator 2.5.2:** proportion of local breeds, classified as being at risk, not-at-risk or unknown level of risk of extinction.

**Indicator 15.6.1:** number of countries that have adopted legislative, administrative and policy frameworks to ensure fair and equitable sharing of benefits.

The **initial baseline** against, which progress towards SDG Target 2.5 is measured, is given by the **number of accessions at June 2014 as reported for** monitoring of the implementation of **the Second Global Plan of Action**. Such a baseline is adjusted according to subsequent reports whenever these allow for a more accurate estimate of the indicator and the diversity actually conserved.

**Asha:** *“To report on this indicator, I have to communicate data about the **accessions**<sup>1</sup> of plant genetic resources for food and agriculture secured in genebanks, under medium- or long-term conditions, in my country.”*



The plant component of Indicator 2.5.1 is equivalent to Indicator 20 of the Second Global Plan of Action.

### Reporting process for the plant component of Indicator 2.5.1

#### The National Focal Point:

**STEP 1** - Collects data from national genebanks.

**STEP 2** - Downloads an empty Excel spreadsheet from WIEWS, fills it and submits it to [wiews@fao.org](mailto:wiews@fao.org).

There is also an indirect reporting process that the National Focal Point can use when data are already available on-line. This will be discussed further in the lesson.

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<sup>1</sup> An accession is a sample of seeds, planting materials or plants, representing a wild population, a farmer's variety or landrace, a breeding line or an improved cultivar, which is conserved in a genebank. Each accession should be distinct and, in terms of genetic integrity, as close as possible to the sample originally provided.



The Excel spreadsheet to be submitted to FAO to report on the plant component of Indicator 2.5.1 requests that the National Focal Point fill in **13 descriptors for each accession reported** (to identify it, where it comes from, where it is held). These descriptors are **a subset of the 29 FAO/Biodiversity Multi-Crop Passport Descriptors (MPCD)**, used by genebanks around the world to exchange information about their accessions.

<div> <div>5. Genus</div> <div>6. Species</div> <div>8. Subtaxon</div> </div> <div>Merged in 'Name of taxon'</div>	0. Persistent unique identifier	8. Subtaxon	16. Elevation of collecting site	23. Donor accession number
	1. Institute code	9. Subtaxon authority	17. Collecting date of sample	24. Other identifiers
	2. Accession number	10. Common crop name	18. Breeding institute code	25. Location of safety duplicates
	3. Collecting number	11. Accession name	19. Biological status of accession	26. Type of germplasm storage
	4. Collecting institute code	12. Acquisition date	20. Ancestral data	27. Multilateral System status
	5. Genus	13. Country of origin	21. Collecting/acquisition source	28. Remarks
	6. Species	14. Location of collecting site	22. Donor institute code	
	7. Species authority	15. Geographical coordinates		

Let's analyse the 13 descriptors to be completed for each accession in the Excel spreadsheet: the **dark green** ones are **mandatory**, the **light green** ones are **highly recommended**, the **light blue** ones are **optional**.

### 1. Holding institute code/name

Views institute code or name of the genebank holding the collection.

It corresponds to MPCD descriptor 1 (INSTCODE).

If the code is unavailable, please contact [WIEWS@fao.org](mailto:WIEWS@fao.org) to receive a code, or use the institute name instead.

Example: DEU146 (Leibniz Institute of Plant Genetics and Crop Plant Research).

### 2. Accession number

Unique identifier for the accession within the genebank, which is assigned when a sample is entered into the genebank collection.

Example: SOL 942

### 3. Name of taxon

Scientific name (without the authority) of the accession, including genus, species and sub-ranking, if any.

It corresponds to the concatenation of MPCD descriptors 5 (GENUS), 6 (SPECIES) and 8 (SUBTAXA).

Omit the taxon authority.

Example: *Solanum melongena*

**4. Name of crop**

Common name of the crop.

Example: Eggplant

**5. Acquisition date**

Date on which the accession entered the genebank, where YYYY is the year, MM is the month.

Example: 1999/01

**6. Country of origin**

3-letter ISO 3166-1 code of the country in which the sample was originally collected, bred or selected.

Example: DEU for Germany, KEN for Kenya.

**7. Biological status of accession**

Available options are:

100) Wild

200) Weedy

300) Traditional cultivar/landrace

400) Breeding/research material

500) Advanced or improved cultivar

600) GMO

**8. Genebank(s) holding safety duplications**

WIEWS code(s) or name of the institute(s) holding duplicates of the sample.

Multiple values should be separated by a semicolon.

Example: NOR051; PHL001

**9. Latitude of collecting site**

Latitude of the collection site, in decimal degrees. Important for samples collected from farmer's fields and wild habitats.

Example: 40.798889

**10. Longitude of collecting site**

Longitude of the collection site. Important for samples collected from farmer's fields and wild habitats.

**11. Collecting/acquisition source**

Available options are:

10) Wild habitat

20) Farm or cultivated habitat

- 30) Market or shop
- 40) Institute, experimental station,  
research organization, genebank
- 50) Seed company
- 60) Weedy, disturbed or ruderal habitat

#### 12. Type of germplasm storage

Available options are:

- 12) Seed medium-term
- 13) Seed long-term
- 20) Field
- 30) *In vitro*
- 40) Cryopreservation
- 50) DNA

Multiple values should be separated by a semicolon.

Example: 13) Seed long-term; 20) Field

#### 13. Status under the Multilateral System

Status of the accession under the Multilateral System of Access and Benefit Sharing of the International Treaty for Plant Genetic Resources for Food and Agriculture. It only applies to countries that are party to the Treaty.

Available options are as follows:

Not included or Included

As previously mentioned, there is **another method to report** to FAO on the plant component of **Indicator 2.5.1**. If the data of the country's genebank(s) are published through one or more national or international data systems, using the FAO Multi-Crop Passport Descriptors standards, the National Focal Point can communicate to FAO where to find and download these data.



If there is more than one genebank in a country, and for example only one of them has published data in a data system, the National Focal Point should fill in and submit an Excel to FAO for the other(s).



#### International data systems

Below are some international data systems on plant genetic resources:

**European Cooperative Programme for Plant Genetic Resources (EURISCO)**

A collaborative programme among most European countries aimed at ensuring the long-term conservation and facilitating the increased utilization of plant genetic resources in Europe. [www.ecpgr.cgiar.org/](http://www.ecpgr.cgiar.org/)

### Genesys

A global information portal that currently covers over 480 institutions with information on more than 3.6 million accessions.

Genesys is a joint initiative of CGIAR, the Global Crop Diversity Trust and the Secretariat of the International Treaty on the Plant Genetic Resources for Food and Agriculture at FAO. [www.genesys-pgr.org/welcome](http://www.genesys-pgr.org/welcome)

## Indirect reporting process for the plant part of Indicator 2.5.1

**STEP 1** - The National Focal Point tells FAO where the data are held and provides access to the database.

**STEP 2** - FAO harvests the data and incorporates them in the WIEWS system.



When reporting on the plant component of Indicator 2.5.1, what data should a National Focal Point retrieve from genebanks?

**Asha:** “A National Focal Point should report data on all the **collections of accessions that are held in genebanks with the main purpose of preserving them**. This includes:

- all accessions in base collections, plus
- all accessions in active collections that are not yet represented in a base collection but that should be included in a base collection in the near future.”

### Genebanks base collections

Genebanks base collections include a **set of distinct accessions** that are **stored** with the purpose of **preserving them indefinitely**.

Base collections are usually maintained under medium- or long-term conditions as seed, plant, tissues, pollen or DNA. Field and *in-vitro* collections can also fit the purpose of base collections. Accessions conserved in base collections are not meant for distribution or any other use, except regeneration when required for the continued preservation of the viability and genetic integrity of the material.

### Genebanks active collections

Genebank active collections include **accessions** that are used for regeneration, multiplication, distribution, characterization and evaluation. Active collections are maintained in short to medium-

term storage and are usually duplicated in a base collection maintained in medium- to long-term storage.



More information on active and base collections can be found in Lesson 2



When reporting on the plant component of Indicator 2.5.1, what are the errors to avoid?

**Asha:** *“For a correct inventory of conserved plant genetic resources, it’s important to **avoid reporting duplicates**: accessions that are conserved in more than one genebank collection. Such accessions should be reported once only!*

*It is also important **not to report incorrect and/or unnecessary information**.*

*For example, the latitude and longitude of the collection source are particularly useful if the sample was collected in the wild or from a farmer’s field. But if it comes from a market, the market’s location has little or no value since the material may have been harvested from a different agro-ecological zone.”*

## Summary

The National Focal Point for plant genetic resources, appointed by the government, is in charge of reporting to FAO on the plant component of Sustainable Development Goal Indicator 2.5.1 and among other responsibilities, of coordinating the conservation of crop varieties in his/her country. Data for this indicator are reported to and accessible from the World Information and Early Warning System on Plant Genetic Resources (WIEWS).

The National Focal Point can report data on conserved material in two ways:

- by sending a Microsoft Excel or a CSV text file to FAO containing the data; or
- indirectly by providing access to downloadable datasets.

All reported data must comply with the Multi-Crop Passport Descriptors, a widely used standard for the exchange of information on plant genetic resources.