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COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Item 8.3 of the Provisional Agenda

Nineteenth Regular Session

Rome, 17–21 July 2023

SECOND REPORT ON THE IMPLEMENTATION OF *THE GLOBAL PLAN OF ACTION FOR THE CONSERVATION, SUSTAINABLE USE AND DEVELOPMENT OF FOREST GENETIC RESOURCES*

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I. INTRODUCTION

1. At its Sixteenth Regular Session, the Commission on Genetic Resources for Food and Agriculture (Commission) adopted targets, indicators and verifiers for forest genetic resources (FGR) to be used as assessment tools for monitoring the implementation of the Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources (Global Plan of Action), as well as a monitoring schedule.¹
2. In 2017, FAO prepared guidelines for preparing country progress reports based on the targets, indicators and verifiers, including a questionnaire and a glossary of technical terms, in consultation with the National Focal Points (NFPs) on FGR. It also prepared guidelines for regional networks and international organizations to report on their contributions to the implementation of the Global Plan of Action. Moreover, FAO made the questionnaire available online for the NFPs to complete through the Open Foris platform.
3. The reporting process for the *First Report on the implementation of the Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources* (First Implementation Report)² took place in 2017–2018, and FAO presented the report to the Seventeenth Regular Session of the Commission in February 2019. The Commission took note of the First Implementation Report, which invited countries to continue implementing the Global Plan of Action and encouraged them to address the findings of the report.³
4. According to the monitoring schedule, the preparation of the *Second Report on the Implementation of the Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources* (Second Implementation Report) coincides with the preparation of *The Second Report on the State of the World's Forest Genetic Resources* (Second Report). For this purpose, the Commission adopted, at its Seventeenth Regular Session, the timeline⁴ and guidelines⁵ for preparing country reports, including the earlier used questionnaire. According to the timeline, the Commission will consider the Second Implementation Report at its current session.
5. This document contains the Second Implementation Report. The questionnaire used to collect progress reports from countries is given in *Appendix I* and the glossary of technical terms in *Appendix II* to this document. Furthermore, the recommended structure and content of reports by regional networks and international organizations is presented in *Appendix III*.

II. PREPARATORY PROCESS

6. The preparation of the Second Implementation Report was initiated in June 2019 when FAO invited Members, through Circular State Letter C/CBD-10,⁶ to update the nominations of the NFPs, as appropriate, and submit their country reports. Through the same letter, FAO also invited the regional networks on FGR and relevant international organizations to submit reports on their contributions to the implementation of the Global Plan of Action.
7. Countries could report by using the online questionnaire, which remained accessible through the Open Foris platform. In cases when countries had filled the questionnaire for the First Implementation Report, their data and information were readily available on the online questionnaire for updating. The questionnaire was explained in detail in Annex I of the reporting guidelines made available in Arabic, English, French, Russian and Spanish.⁷ The completed online questionnaire was considered as the country progress report for the preparation of the Second Implementation Report.

¹ CGRFA-16/17/Report, paragraph 74.

² CGRFA-17/19/10.2/Inf.1

³ CGRFA-17/19/Report, paragraph 74

⁴ CGRFA-17/19/10/3, *Appendix II*.

⁵ CGRFA-17/19/10.3/Inf.1.

⁶ <http://www.fao.org/3/ca5229en/ca5229en.pdf>

⁷ AR: <http://www.fao.org/3/cc3967ar/cc3967ar.pdf>; EN: <https://www.fao.org/3/cc3967en/cc3967en.pdf>; ES: <https://www.fao.org/3/cc3967es/cc3967es.pdf>; FR: <https://www.fao.org/3/cc3967fr/cc3967fr.pdf>; RU: <https://www.fao.org/3/cc3967ru/cc3967ru.pdf>

8. In 2020–2021, FAO organized a series of regional online meetings for NFPs and other national experts in Africa, Asia, Latin America and the Caribbean, Near East and Southwest Pacific. Participants were briefed on the monitoring approach for the implementation of the Global Plan of Action and the new global information system on FGR. The meetings also considered the reporting guidelines and NFPs were provided with a demonstration on how to complete the online questionnaire. Furthermore, they offered an opportunity for the NFPs to exchange their experiences with the preparation of country reports. The regional meetings were attended by a total of 96 NFPs and experts from 48 countries.

9. Throughout the preparatory process, FAO provided, upon request, technical support to NFPs in the finalization of country reports through video calls and electronic mail. Furthermore, FAO has screened the completed questionnaires for possible data-entry errors and inconsistencies, and contacted the NFPs, as necessary.

10. As of April 2023, a total of 73 countries had provided data and information through the online questionnaire for the preparation of the Second Implementation Report (Table 1).

Table 1. List of countries (73) that provided data and information through the online questionnaire (as of April 2023).

| Region | Countries |
|---------------------------------|--|
| Africa | Burkina Faso, Eswatini, Ethiopia, Guinea, Kenya, Madagascar, Mali, Mauritania, Morocco, Namibia, Niger, Nigeria, South Africa, Zimbabwe |
| Asia | China, India, Indonesia, Japan, Republic of Korea, Lao People's Democratic Republic, Malaysia, Sri Lanka, Thailand |
| Europe | Armenia, Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Italy, Lithuania, Luxembourg, Malta, Netherlands (Kingdom of the), Norway, Poland, Portugal, Russian Federation, Serbia, Slovenia, Spain, Sweden, Switzerland, Türkiye, Ukraine |
| Latin America and the Caribbean | Argentina, Brazil, Chile, Ecuador, El Salvador, Mexico, Panama, Saint Lucia |
| Near East | Iran (Islamic Republic of), Lebanon, Yemen |
| North America | Canada, United States of America |
| Southwest Pacific | Australia, Cook Islands, Fiji, Vanuatu |

11. Reports were also received from the Asia Pacific Forest Genetic Resources Programme (APFORGEN)⁸ and the European Forest Genetic Resources Programme (EUFORGEN).⁹ In addition, Bioversity International¹⁰, Botanic Gardens Conservation International (BGCI)¹¹ and the Royal Botanic Gardens, Kew (RBG)¹² and World Agroforestry¹³ submitted reports.

III. RESPONSES OF COUNTRIES TO THE GLOBAL PLAN OF ACTION

12. The policy responses of countries to the Global Plan of Action are tracked by four targets and ten indicators (see Part A of the questionnaire in *Appendix I*). All 73 reporting countries provided data and information on their progress against these targets and indicators. The findings are presented in the following sections based on Targets A.1, A.2, A.3 and A.4, and related indicators and verifiers.

⁸ <http://www.apforgen.org/>

⁹ <http://www.euforgen.org/>

¹⁰ <https://alliancebioversityciat.org/>

¹¹ <https://www.bgci.org/>

¹² <https://www.kew.org/>

¹³ <https://www.worldagroforestry.org/>

TARGET A.1: AVAILABILITY OF DATA AND INFORMATION ON FGR IS INCREASED

Indicator A.1.1: Extent of national FGR inventories or similar arrangements

13. Globally, 48 countries reported having an operational national FGR inventory or a similar arrangement in place and another nine countries reported having initiated the establishment of such an inventory (Figure 1). The list of countries with national FGR inventories or similar arrangements is presented in Table 2.

14. In 2012, i.e. the year before the adoption of the Global Plan of Action by the FAO Conference, 41 countries had established a national FGR inventory (Figure 2). Between 2012 and 2016, seven countries (China, Ecuador, France, Luxembourg, Mali, Malaysia and Sweden) reported the establishment of such a mechanism. Since 2016, no new national FGR inventories have been established (Figure 2).

15. The most common areas of work or activities documented by the national inventories are conservation of FGR (reported by 43 countries), followed by research and development efforts (39) and the production of forest reproductive material (39) (Figure 3). Only 20 countries reported documenting FGR transferred internationally and six countries tracked other related aspects (e.g. species composition and species at risk).

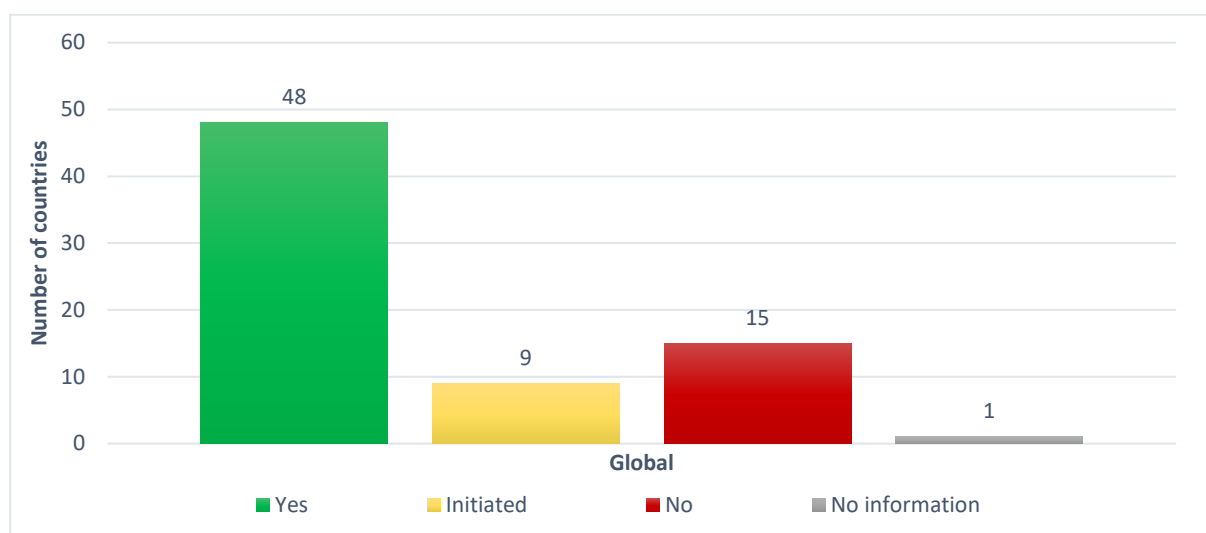


Figure 1. Number of countries with operational national FGR inventories or similar arrangements.

Table 2. List of countries with national FGR inventories or similar arrangements.

| Region | Countries |
|-------------------|--|
| Africa | Burkina Faso, Ethiopia, Guinea, Morocco, Niger, South Africa, Zimbabwe |
| Asia | China, India, Indonesia, Japan, Republic of Korea, Lao People's Democratic Republic, Malaysia |
| Europe | Austria, Belgium, Bulgaria, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Lithuania, Luxembourg, Malta, Netherlands (Kingdom of the), Norway, Poland, Portugal, Russian Federation, Serbia, Slovenia, Spain, Sweden, Switzerland, Türkiye |
| Latin America | Chile, Ecuador |
| Near East | Yemen |
| North America | Canada, United States of America |
| Southwest Pacific | Australia |



Figure 2. Development of the national FGR inventories in 2012–2022.

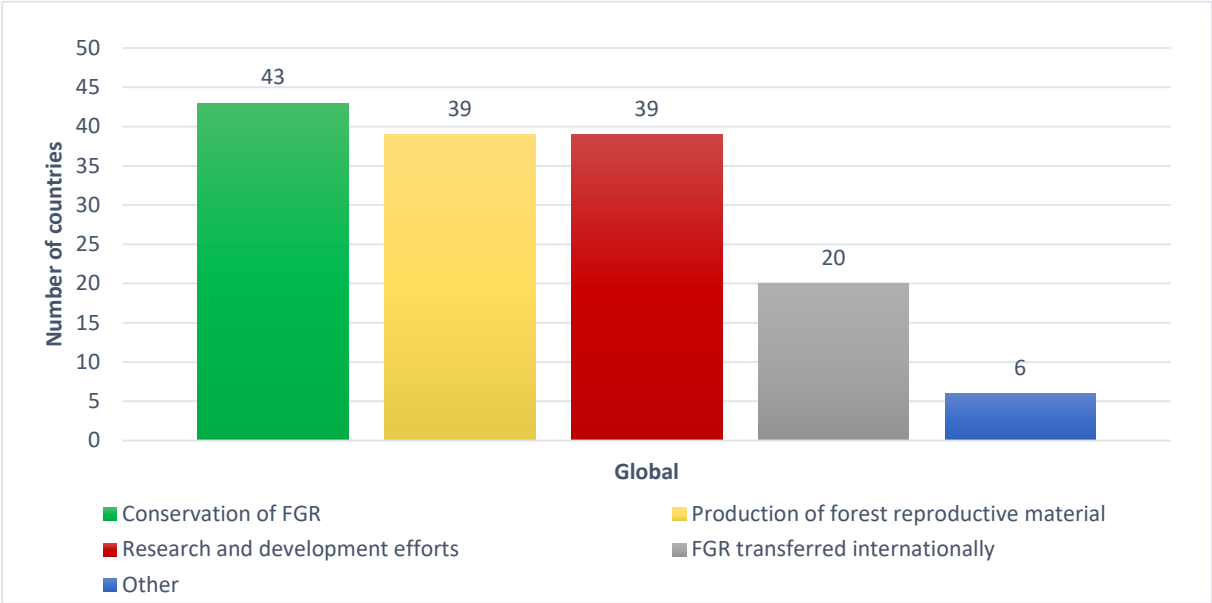


Figure 3. Areas of work documented by national FGR inventories.

Indicator A.1.2: Extent of up-to-date national FGR information systems

16. Globally, 41 countries reported having a national FGR information system or similar arrangement in place and another 17 countries reported having initiated the establishment of such a system (Figure 4). The list of countries with national FGR information systems or similar arrangements is presented in Table 3.

17. In 2012, 34 countries had established national FGR information systems (Figure 5). Between 2012 and 2022, seven countries (Bulgaria, Burkina Faso, Luxembourg, Mexico, Panama, Sweden and Thailand) reported the establishment of such a system.

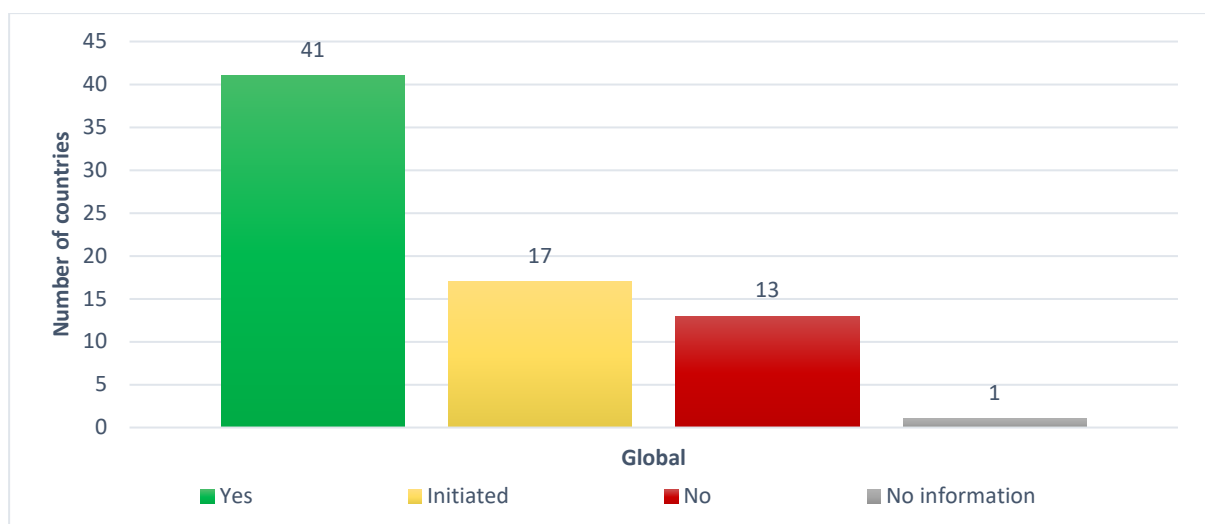


Figure 4. Number of countries with up-to-date national FGR information systems or similar arrangements.

Table 3. List of countries with a national FGR information system or similar arrangement.

| Region | Countries |
|-------------------|---|
| Africa | Burkina Faso, Ethiopia, Guinea, Morocco, Niger, South Africa |
| Asia | China, India, Japan, Republic of Korea, Malaysia, Sri Lanka, Thailand |
| Europe | Belgium, Bulgaria, Croatia, Czechia, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Lithuania, Luxembourg, Malta, Netherlands (Kingdom of the), Norway, Poland, Portugal, Russian Federation, Slovenia, Spain, Sweden, Türkiye |
| Latin America | Chile, Panama |
| Near East | - |
| North America | Canada, United States of America |
| Southwest Pacific | Australia |

18. The most common areas of work or activities recorded by the information systems were conservation of FGR (reported by 35 countries), followed by the production of forest reproductive material (34), research and development efforts (31) (Figure 6). Information systems in 14 countries record FGR transferred internationally and in four countries other related activities.

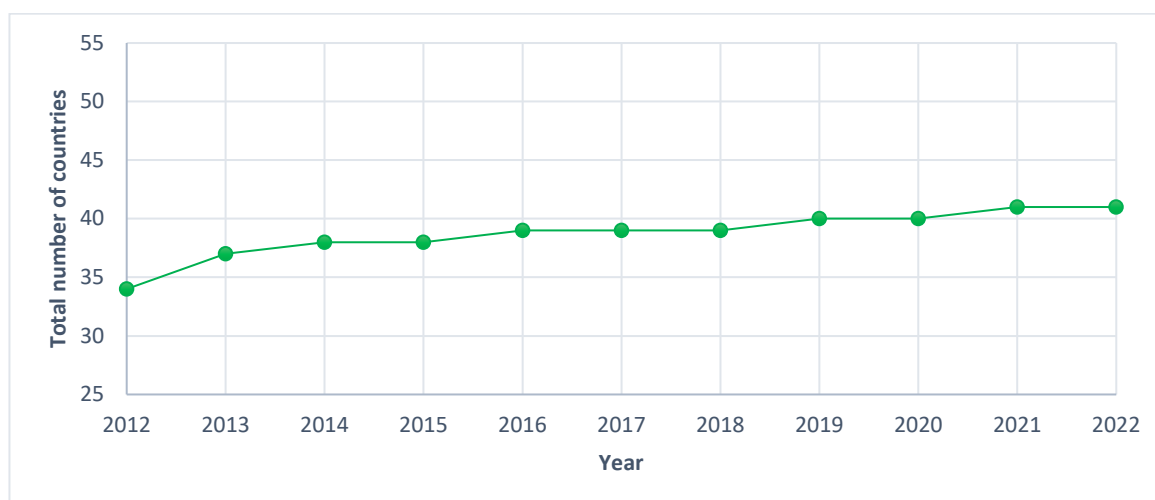


Figure 5. Development of the national FGR information systems in 2012–2022.

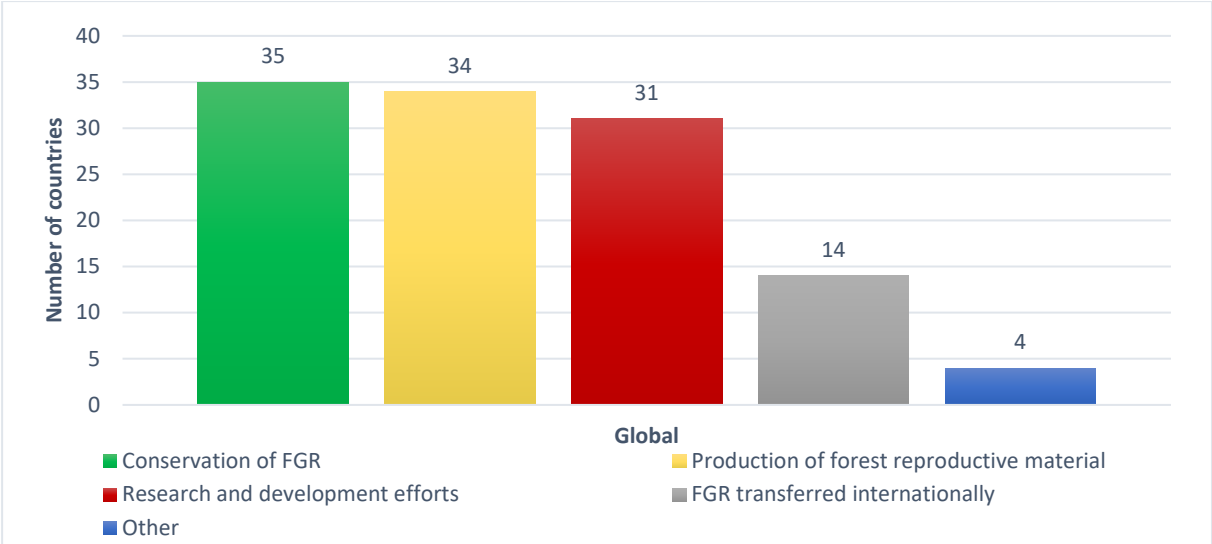


Figure 6. Areas of work recorded in the information systems.

TARGET A.2: NATIONAL *IN SITU* AND *EX SITU* SYSTEMS FOR FGR CONSERVATION ARE STRENGTHENED

Indicator A.2.1: Extent of national *in situ* conservation systems

19. Globally, 62 countries reported having operational national *in situ* conservation systems in place and four countries reported having initiated the establishment of such a system (Figure 7). The list of countries with operational national *in situ* conservation systems is presented in Table 4.

20. In 2012, 50 countries had established national *in situ* conservation systems (Figure 8). Between 2012 and 2022, six countries (Luxembourg, Malta, Mexico, Panama, Spain and Sweden) reported the establishment of such a system. Of the 62 countries with national *in situ* conservation systems, six were unable to report the establishment year.

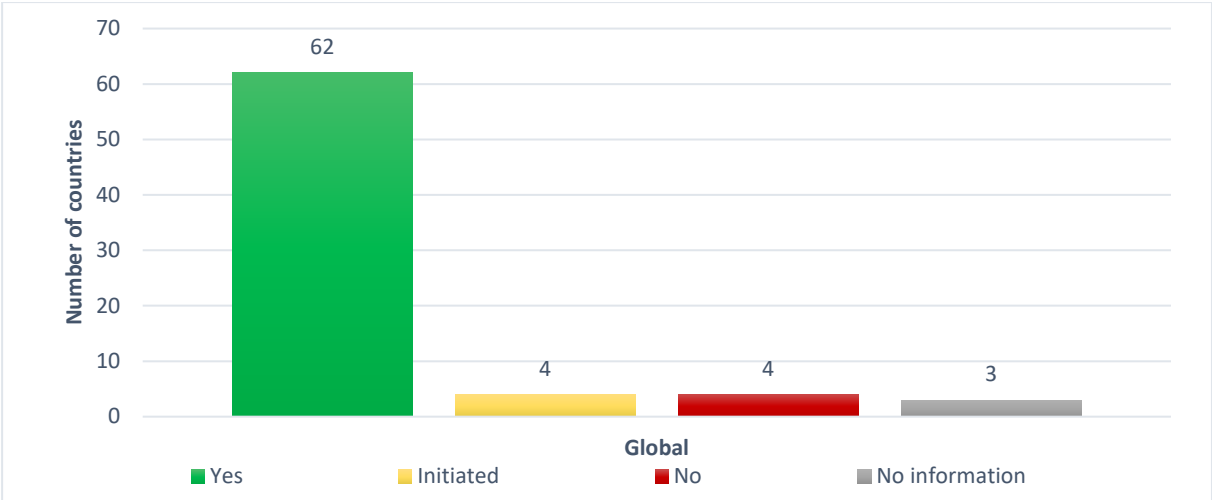
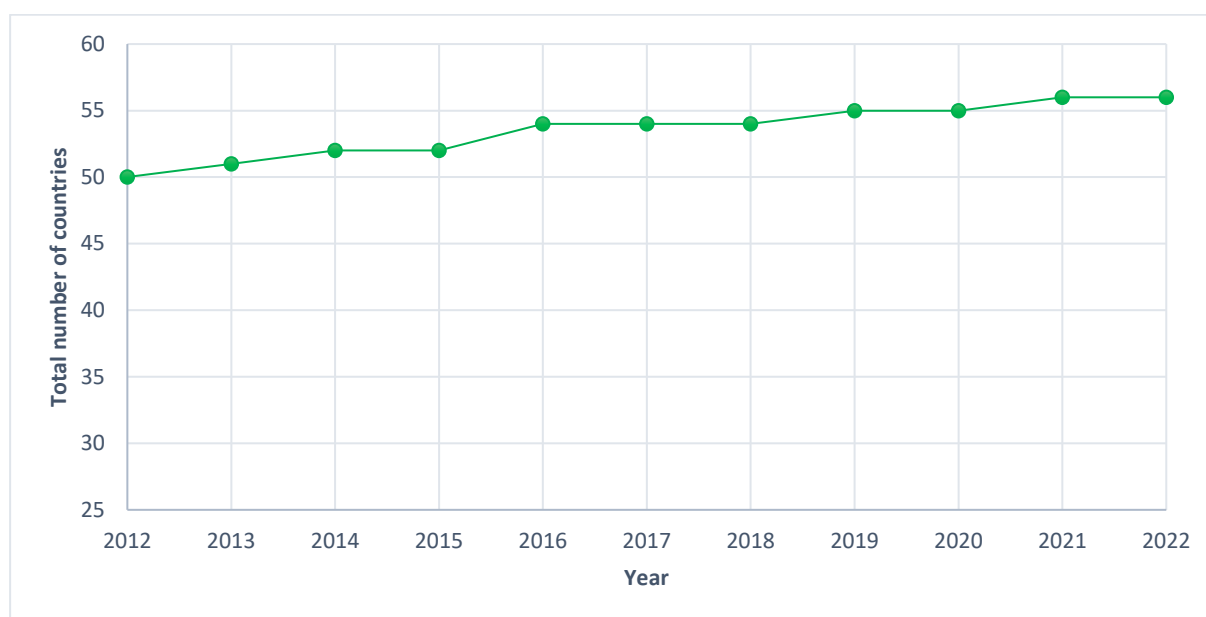


Figure 7. Number of countries with operational national *in situ* conservation systems.

Table 4. List of countries with operational national *in situ* conservation systems.

| Region | Countries |
|-------------------|---|
| Africa | Burkina Faso, Ethiopia, Guinea, Kenya, Madagascar, Mauritania, Morocco, Namibia, Niger, Nigeria, South Africa, Zimbabwe |
| Asia | China, Indonesia, Japan, Republic of Korea, Lao People's Democratic Republic, Sri Lanka, Thailand |
| Europe | Austria, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Iceland, Ireland, Italy, Lithuania, Luxembourg, Malta, Netherlands (Kingdom of the), Norway, Poland, Portugal, Russian Federation, Serbia, Slovenia, Spain, Sweden, Switzerland, Türkiye, Ukraine |
| Latin America | Argentina, Brazil, Chile, Ecuador, El Salvador, Mexico, Panama, Saint Lucia |
| Near East | Lebanon, Yemen |
| North America | Canada |
| Southwest Pacific | Australia, Fiji |

21. The most common components of the *in situ* systems were protected areas (reported by 54 countries) and *in situ* conservation units of FGR (51), followed by forests managed for production of wood and/or non-wood products (41). Four countries reported other components (e.g. permanent monitoring or research plots and sacred forests) being included in their *in situ* systems.

**Figure 8.** Development of the national *in situ* conservation systems in 2012–2022.

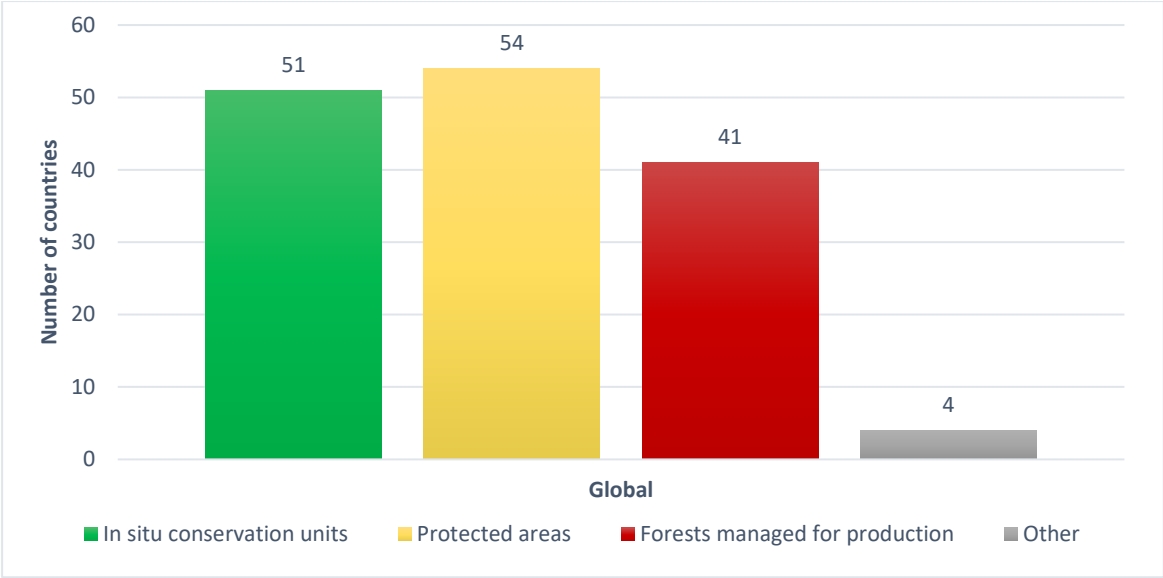


Figure 9. Different components of the national *in situ* conservation systems.

Indicator A.2.2: Extent of national *ex situ* conservation systems

22. A total of 56 countries reported having operational national *ex situ* conservation systems in place and seven countries reported having initiated the establishment of such a system (Figure 10). The list of countries with national *ex situ* conservation systems is presented in Table 5.

23. The most recent national *ex situ* conservation system was established in 2011 (Mexico), and since 2012 no country has reported the establishment of such a system (Figure 11). Of the 56 countries with national *ex situ* conservation systems, five were unable to report the establishment year.

24. The most common components of the *ex situ* conservation systems were storage facilities for seed, pollen and other tissue (reported by 49 countries), followed by *ex situ* conservation stands (48) and field collections (47 countries) (Figure 12). Eight countries reported other components (e.g. arboreta, botanic gardens and DNA banks) being included in their *ex situ* systems.

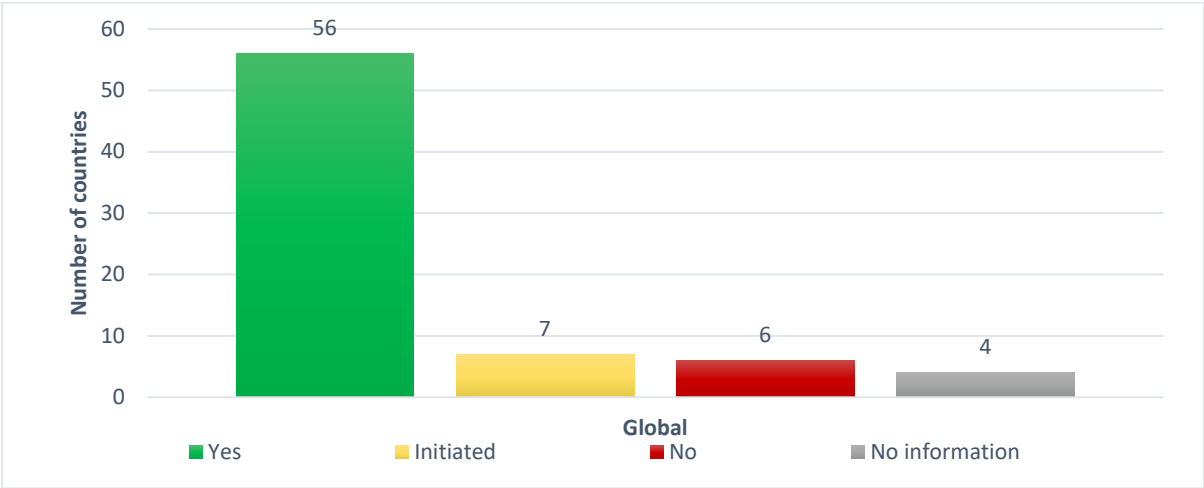
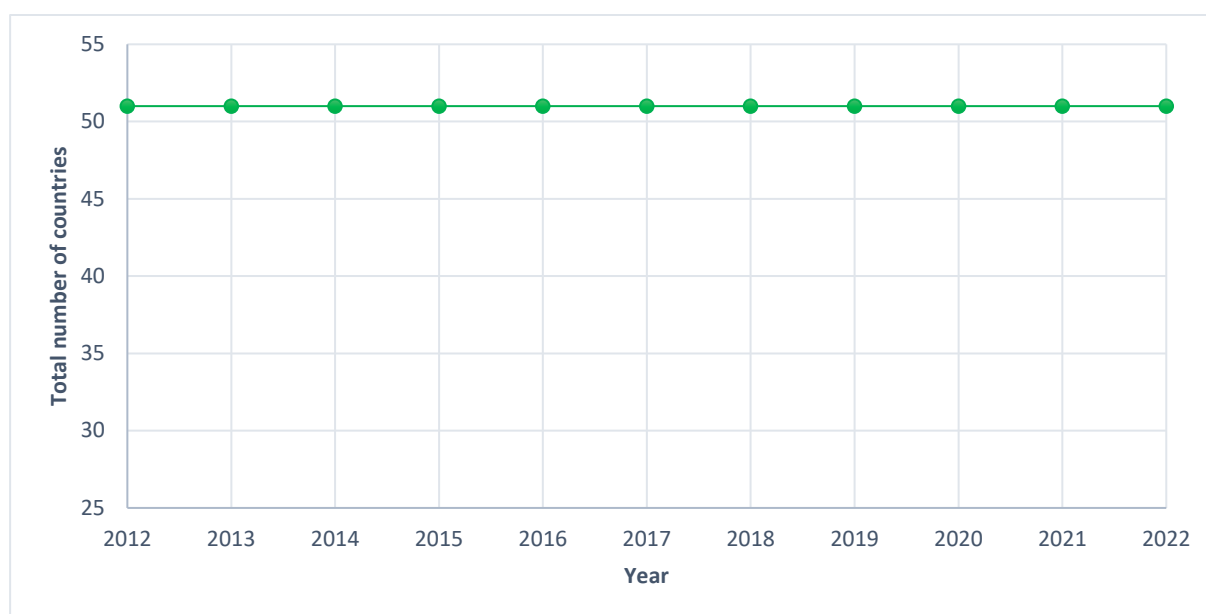


Figure 10. Number of countries with operational national *ex situ* conservation systems.

Table 5. List of countries with operational national *ex situ* conservation systems.

| Region | Countries |
|-------------------|---|
| Africa | Burkina Faso, Ethiopia, Guinea, Kenya, Madagascar, Mali, Morocco, Namibia, Nigeria, South Africa, Zimbabwe |
| Asia | China, India, Indonesia, Japan, Republic of Korea, Lao People's Democratic Republic, Sri Lanka, Thailand |
| Europe | Austria, Belgium, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Luxembourg, Netherlands (Kingdom of the), Norway, Poland, Portugal, Russian Federation, Serbia, Slovenia, Sweden, Switzerland, Türkiye, Ukraine |
| Latin America | Argentina, Chile, Ecuador, El Salvador, Mexico |
| Near East | Iran (Islamic Republic of), Yemen |
| North America | Canada |
| Southwest Pacific | Australia, Fiji |

**Figure 11.** Development of national *ex situ* conservation systems.

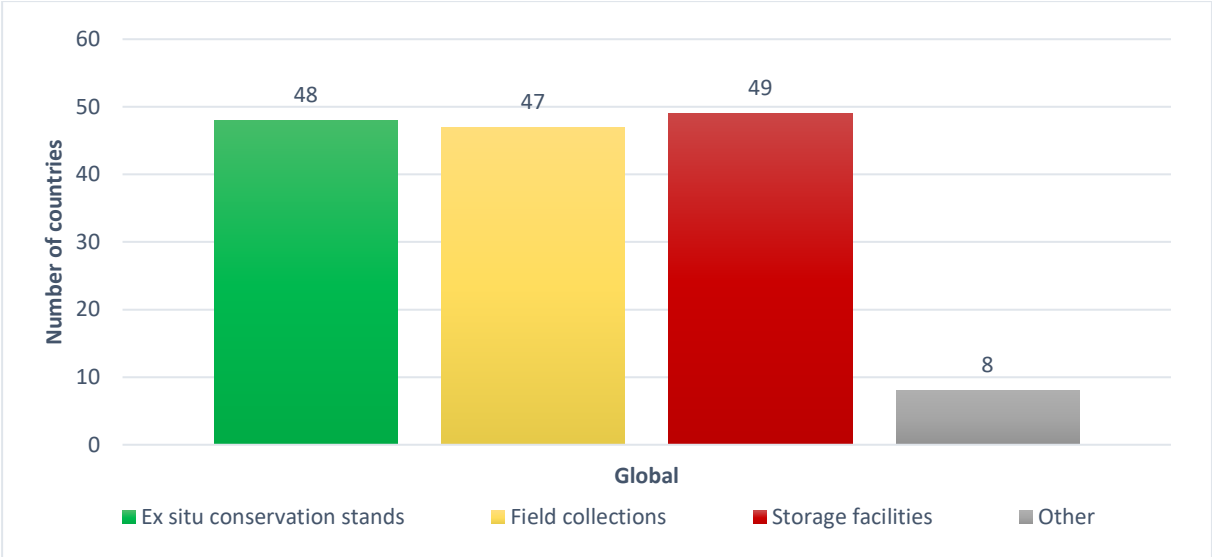


Figure 12. Different components of national *ex situ* conservation systems.

TARGET A.3: TREE SEED AND BREEDING PROGRAMMES, AS WELL AS EXTENSION EFFORTS ON FGR USE, ARE REINFORCED, INCLUDING FOR CONSERVATION COLLECTIONS

Indicator A.3.1: Extent of national tree seed programmes

25. Globally, 52 countries reported having national tree seed programmes or similar arrangements in place and nine countries reported having initiated the establishment of such a programme (Figure 13). The list of countries with national tree seed programmes or similar arrangements is presented in Table 6.

26. In 2012, at least 48 countries had established national tree seed programmes (Figure 14). Between 2017 and 2020, three countries (Fiji, India and Japan) reported the establishment of such a programme. Of the 52 countries with the national tree seed programmes, one was unable to report the establishment year.

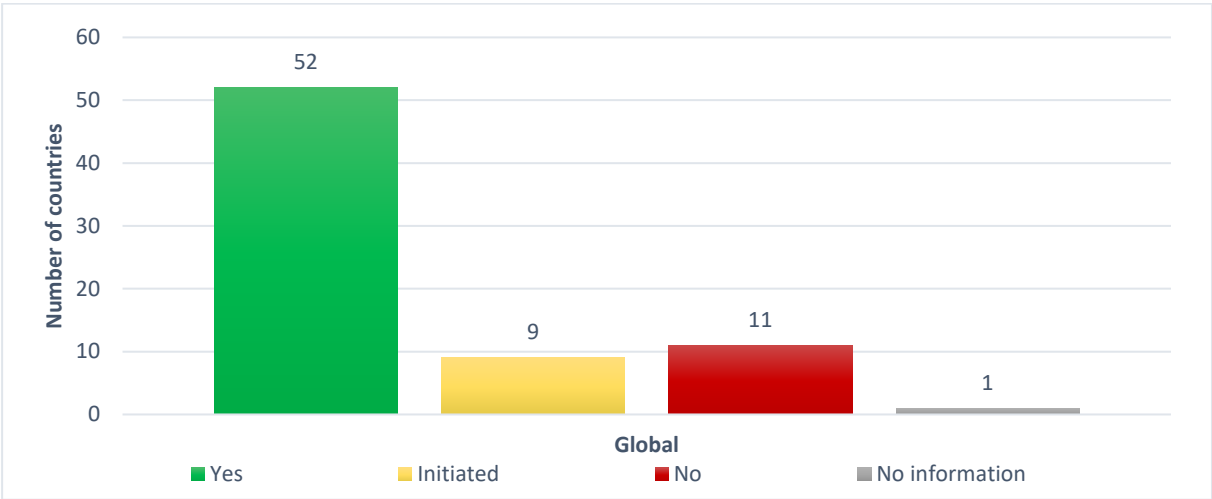
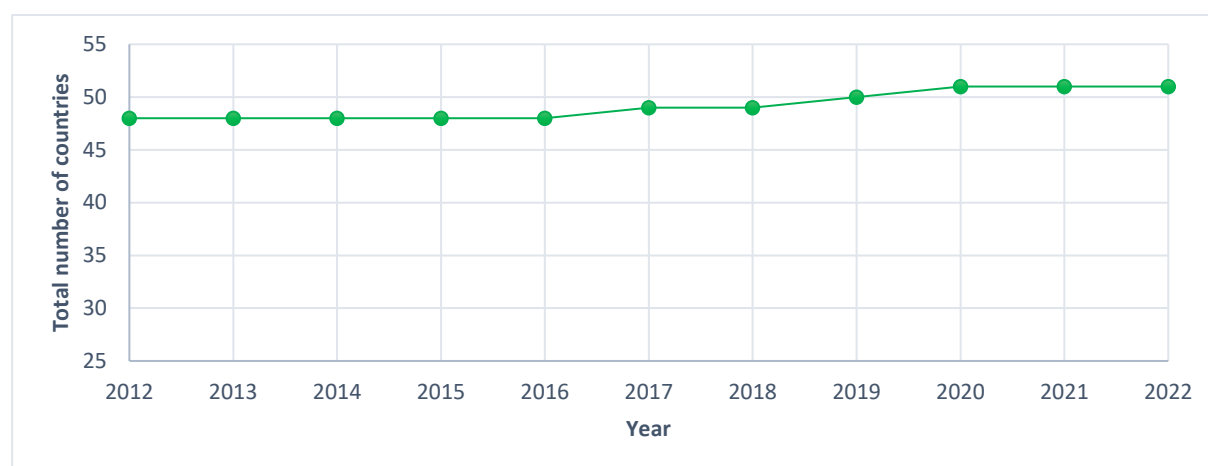


Figure 13. Number of countries with operational national tree seed programmes.

Table 6. List of countries with operational national tree seed programmes.

| Region | Countries |
|-------------------|---|
| Africa | Burkina Faso, Eswatini, Ethiopia, Guinea, Kenya, Madagascar, Mali, Morocco, Namibia, Nigeria, South Africa, Zimbabwe |
| Asia | China, Japan, Republic of Korea, Lao People's Democratic Republic, Malaysia, Sri Lanka, Thailand |
| Europe | Belgium, Croatia, Czechia, Denmark, Estonia, Finland, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Netherlands (Kingdom of the), Norway, Poland, Portugal, Russian Federation, Slovenia, Spain, Sweden, Switzerland, Türkiye, Ukraine |
| Latin America | Argentina, Chile, El Salvador, Mexico, Panama |
| Near East | Iran (Islamic Republic of) |
| North America | Canada |
| Southwest Pacific | Australia, Fiji |

**Figure 14.** Development of national tree seed programmes in 2012–2022.

Indicator A.3.2: Extent of tree breeding programmes

27. A total of 55 countries reported having operational tree breeding programmes in place and in three countries such a programme is being established (Figure 15). The list of countries with operational tree breeding programmes is presented in Table 7.

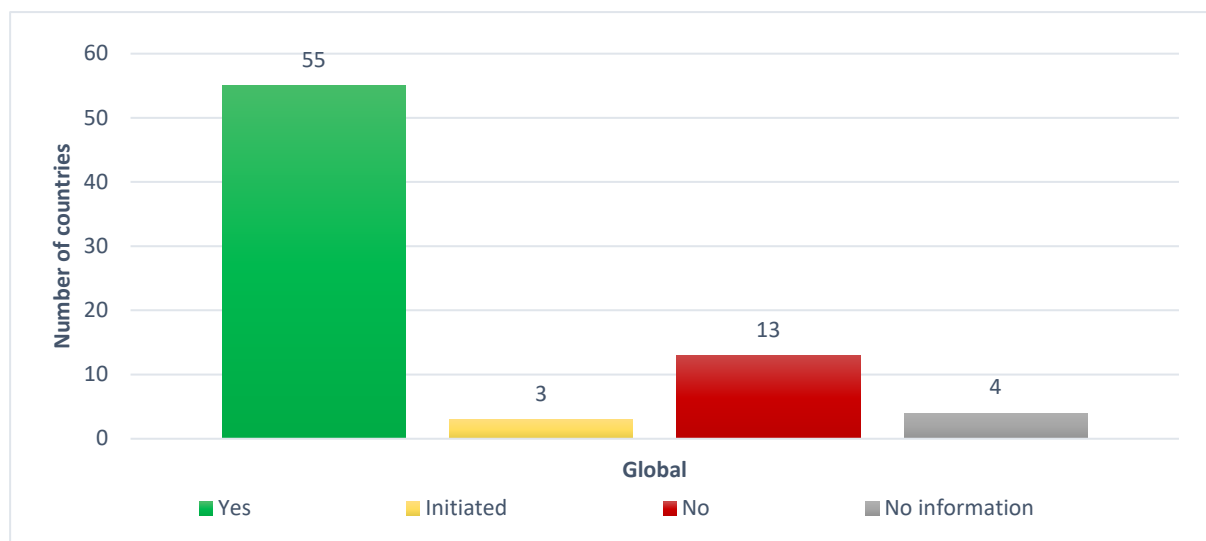


Figure 15. Number of countries with operational tree breeding programmes.

Table 7. List of countries with operational tree breeding programmes.

| Region | Countries |
|-------------------|---|
| Africa | Burkina Faso, Ethiopia, Guinea, Madagascar, Mali, Morocco, Namibia, Nigeria, South Africa |
| Asia | China, India, Japan, Republic of Korea, Lao People's Democratic Republic, Malaysia, Sri Lanka, Thailand |
| Europe | Armenia, Austria, Belgium, Croatia, Czechia, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Lithuania, Luxembourg, Netherlands (Kingdom of the), Norway, Poland, Portugal, Russian Federation, Serbia, Slovenia, Spain, Sweden, Türkiye, Ukraine |
| Latin America | Argentina, Brazil, Chile, Ecuador, Mexico, Panama |
| Near East | Iran (Islamic Republic of) |
| North America | Canada, United States of America |
| Southwest Pacific | Australia, Indonesia |

28. The main stakeholder groups operating tree breeding programmes are public entities (reported by 51 countries), followed by private companies (31) and public-private partnerships (22) (Figure 16). Eleven countries reported other stakeholders (e.g. registered charities and non-profit associations) that are operating tree breeding programmes.

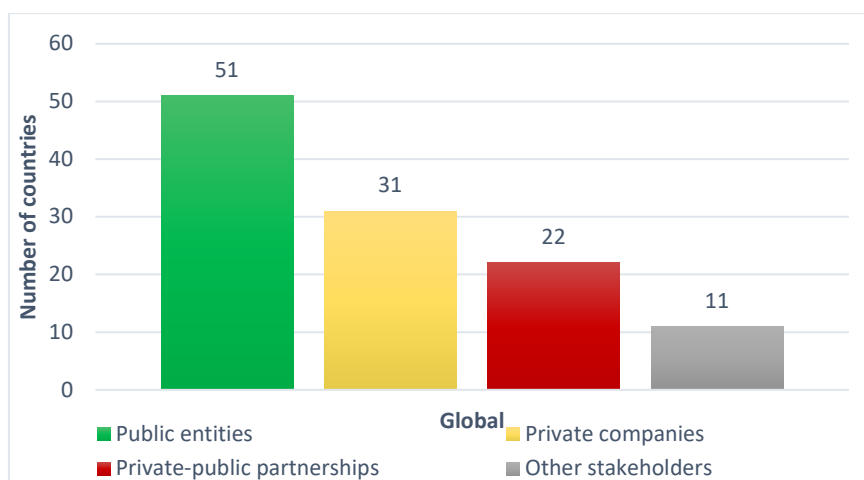


Figure 16. Main stakeholder groups operating tree breeding programmes.

Indicator A.3.3: Extent of extension efforts promoting appropriate use of FGR

29. Globally, 45 countries reported having ongoing extension programmes or activities on FGR use and eleven countries reported having initiated the establishment of such programmes or activities (Figure 17). The list of countries with ongoing extension programmes or activities on FGR is presented in Table 8.

30. In 2012, at least 30 countries had established extension programmes on FGR use (Figure 18). Between 2012 and 2019, eight countries (Czechia, Ecuador, Fiji, Ireland, Japan, Lithuania, Malta and Panama) reported the establishment of such programmes. Since 2019, no new extension programmes have been established (Figure 18). Of the 45 countries with the extension programmes, seven were unable to report the establishment year.

31. The main FGR users targeted by the extension programmes are forest owners (reported by 35 countries), followed by local communities (28) and farmers (27) (Figure 19). Many countries (16) also reported other FGR users (e.g. forest managers, indigenous communities, nurseries, seed traders and traditional healers) being targeted by their extension programmes.

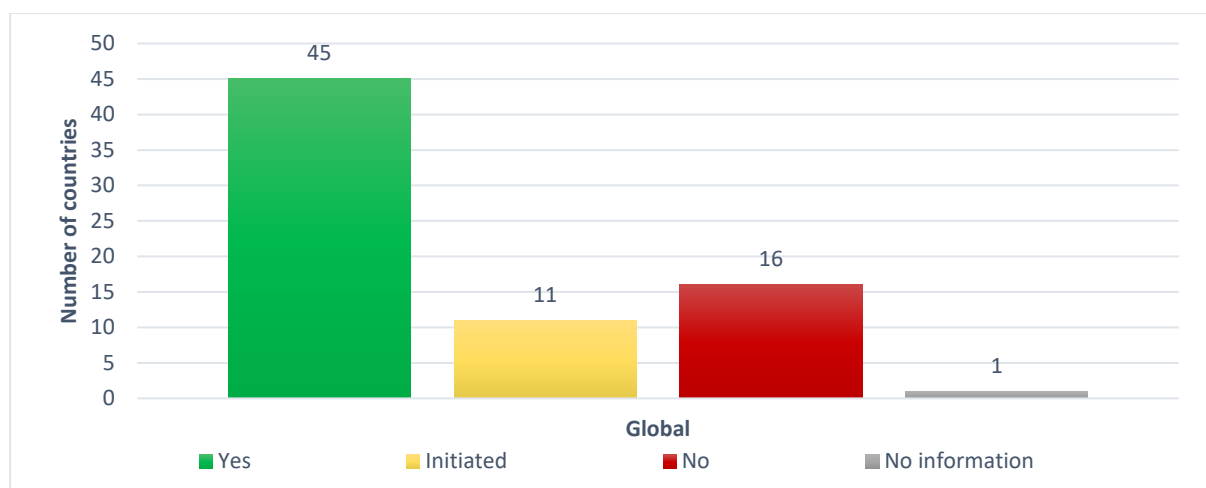


Figure 17. Number of countries with ongoing extension programmes or activities on FGR use.

Table 8. List of countries with ongoing extension programmes or activities on FGR use.

| Region | Countries |
|-------------------|---|
| Africa | Eswatini, Ethiopia, Guinea, Kenya, Madagascar, Mali, Namibia, Niger, Zimbabwe |
| Asia | China, India, Japan, Republic of Korea, Lao People’s Democratic Republic, Malaysia, Sri Lanka, Thailand |
| Europe | Armenia, Belgium, Croatia, Czechia, Denmark, Estonia, Finland, France, Germany, Iceland, Ireland, Lithuania, Malta, Netherlands (Kingdom of the), Norway, Poland, Slovenia, Sweden, Ukraine |
| Latin America | Argentina, Ecuador, Mexico, Panama |
| Near East | Yemen |
| North America | Canada, United States of America |
| Southwest Pacific | Fiji, Vanuatu |

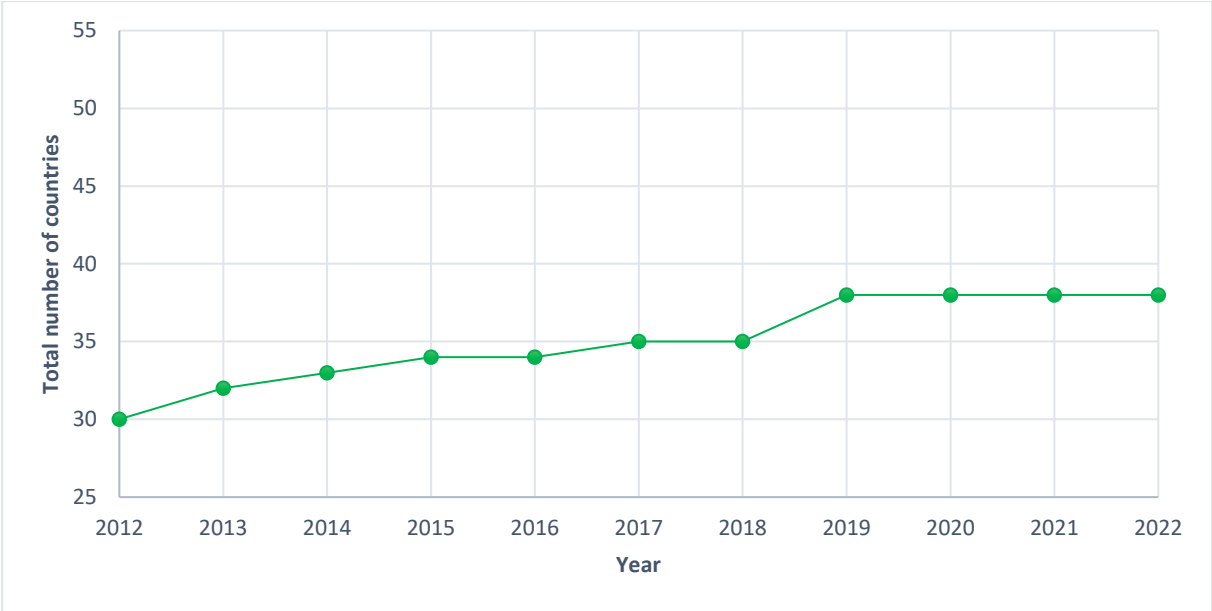


Figure 18. Development of extension programmes on FGR use.

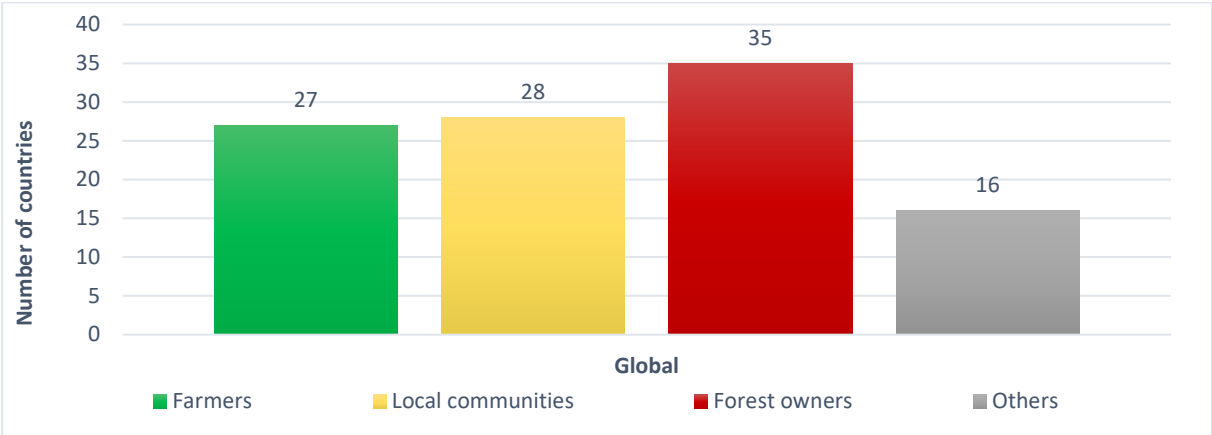


Figure 19. Targeted FGR users of extension programmes.

TARGET A.4: NATIONAL COORDINATION MECHANISMS ON FGR ARE CREATED, AND NATIONAL STRATEGIES FOR FGR CONSERVATION AND USE ARE DEVELOPED AND IMPLEMENTED

Indicator A.4.1: Extent of national coordination mechanisms on FGR

32. A total of 40 countries reported having a national coordination mechanism on FGR in place and twelve countries reported having initiated the establishment of such a mechanism (Figure 20). The list of countries with a national coordination mechanism on FGR is presented in Table 9.

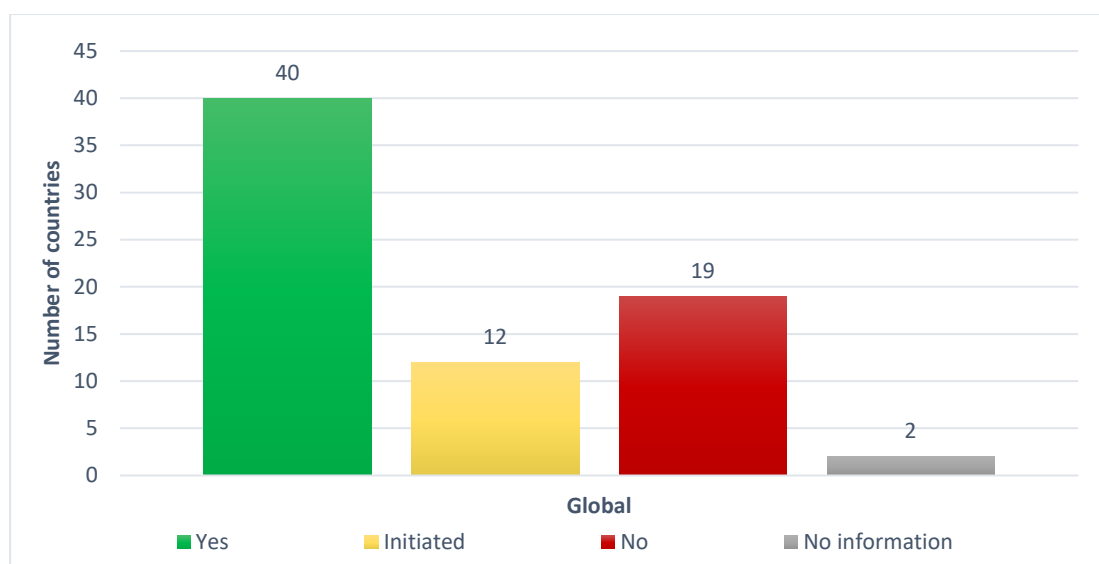


Figure 20. Number of countries with national coordination mechanisms on FGR.

Table 9. List of countries with a national coordination mechanism on FGR.

| Region | Countries |
|-------------------|--|
| Africa | Burkina Faso, Ethiopia, Guinea, Mali, Namibia, South Africa, Zimbabwe |
| Asia | China, India, Japan, Republic of Korea, Thailand |
| Europe | Croatia, Cyprus, Czechia, Denmark, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Lithuania, Luxembourg, Malta, Norway, Poland, Russian Federation, Serbia, Slovenia, Spain, Sweden, Türkiye, Ukraine |
| Latin America | Brazil, Mexico |
| Near East | Iran (Islamic Republic of), Yemen |
| North America | Canada |
| Southwest Pacific | - |

33. In 2012, at least 30 countries had established a national coordination mechanism on FGR (Figure 21). Between 2012 and 2020, eight countries (Iran (Islamic Republic of), Ireland, Japan, Luxembourg, Malta, Mexico, Russian Federation and South Africa) reported having established such a mechanism. No new national coordination mechanisms have been established since 2020 (Figure 21). Of the 40 countries with the national coordination mechanism, two were unable to report the establishment year.

34. The main stakeholders involved in the national coordination mechanisms are governmental organizations (reported by 40 countries) and research organizations (38), followed by relevant ministries (24), forest owners (19) and non-governmental organizations (NGOs) (18) (Figure 22).

A few countries reported the involvement of the private sector (15), farmers (8) and other stakeholders (2) (Figure 22).

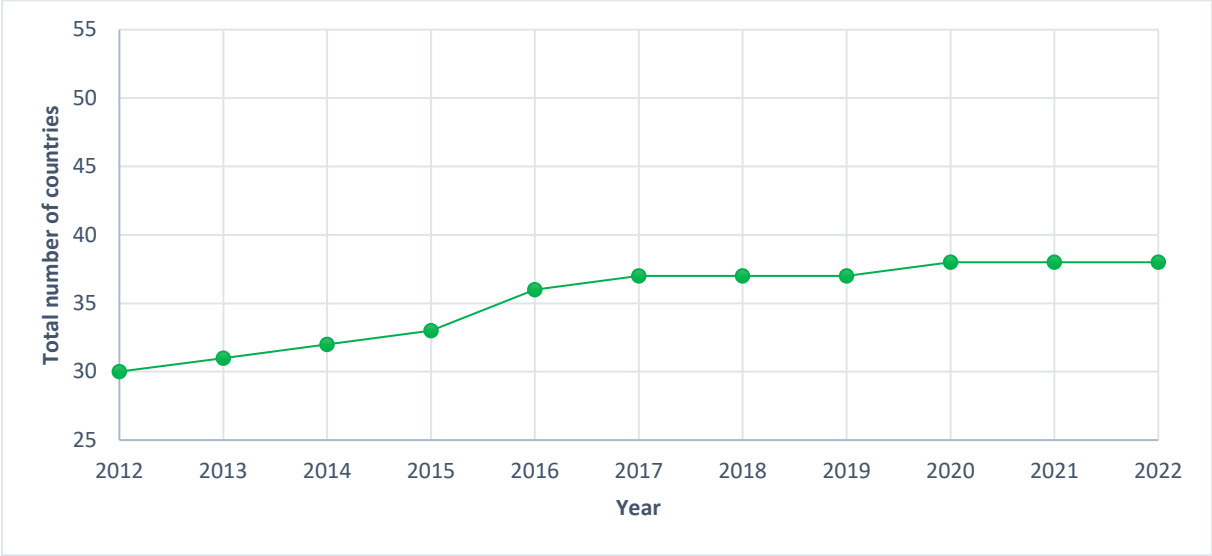


Figure 21. Development of national coordination mechanisms on FGR.

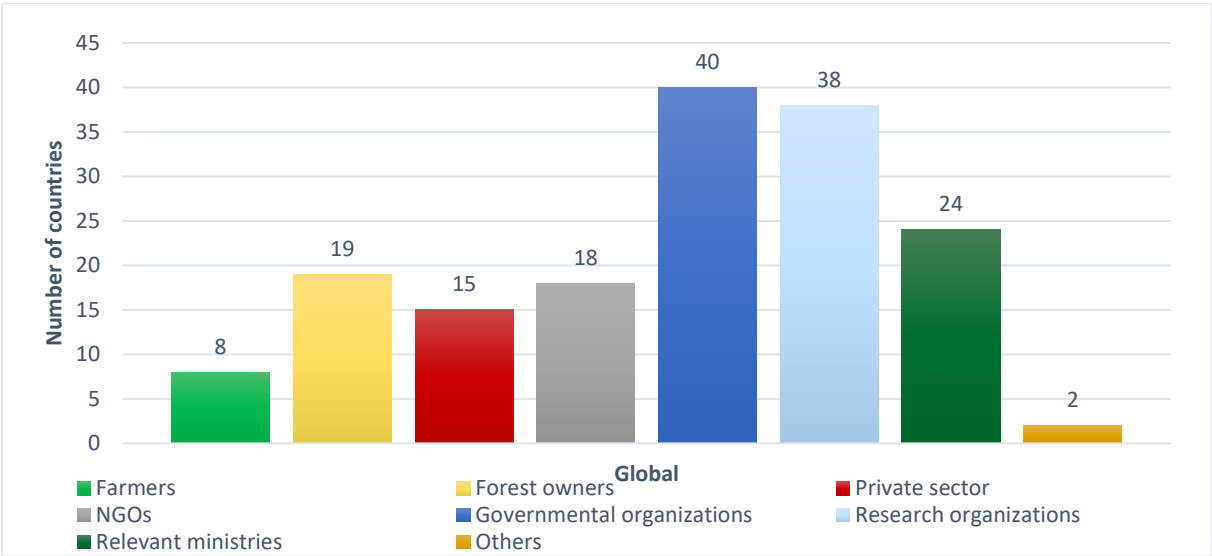


Figure 22. Stakeholders involved in national FGR coordination mechanisms.

Indicator A.4.2: Extent of national strategies for FGR conservation and use

35. Globally, 43 countries reported having a national strategy (or subnational strategy) for FGR conservation and use in place and 13 countries reported having initiated the establishment of such a strategy (Figure 23). The list of countries with national strategies for FGR conservation and use is presented in Table 10.

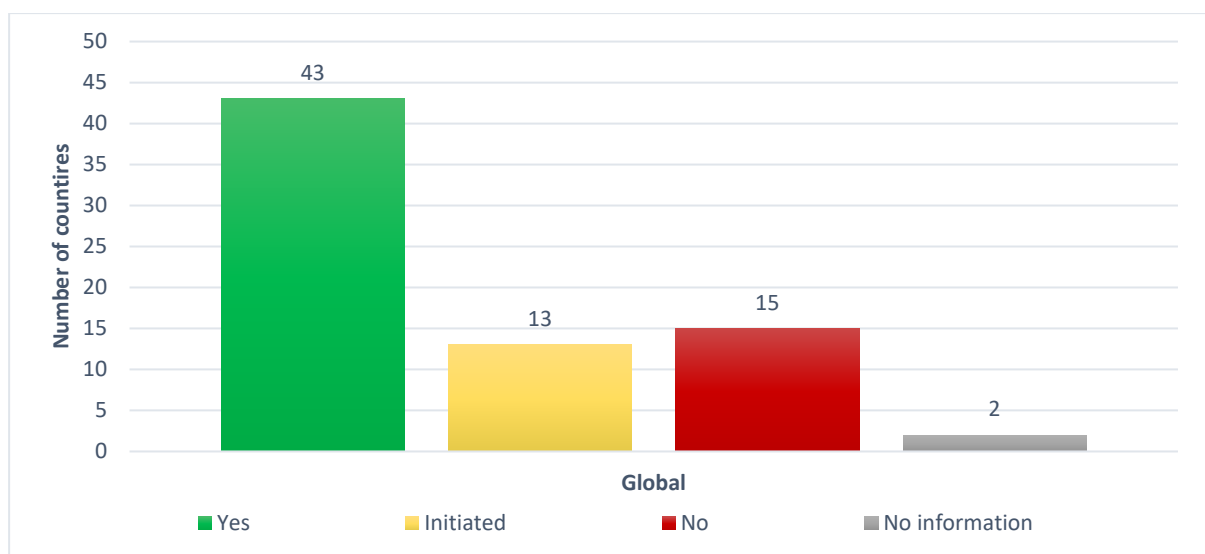


Figure 23. Number of countries with a national strategy (or subnational strategies) for FGR conservation and use.

Table 10. List of countries with national (or subnational) strategies for FGR conservation and use.

| Region | Countries |
|-------------------|---|
| Africa | Ethiopia, Guinea, Kenya, Madagascar, Mali, Namibia, Niger, South Africa, Zimbabwe |
| Asia | China, India, Japan, Republic of Korea, Lao People's Democratic Republic, Malaysia |
| Europe | Cyprus, Czechia, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Lithuania, Luxembourg, Malta, Netherlands (Kingdom of the), Norway, Serbia, Slovenia, Spain, Sweden, Türkiye |
| Latin America | Brazil, Ecuador, Mexico |
| Near East | Iran (Islamic Republic of), Yemen |
| North America | Canada, United States of America |
| Southwest Pacific | Australia, Vanuatu |

36. In 2012, at least 27 countries had established a national strategy (or subnational strategy) for FGR conservation and use (Figure 24). Between 2012 and 2022, nine countries (China, Ecuador, India, Ireland, Japan, Kenya, Lao People's Democratic Republic, Serbia and Sweden) reported the establishment of such a strategy. Of the 43 countries with national (or subnational) strategies for FGR conservation and use, seven were unable to report the establishment year.

37. The national (or subnational) strategies mainly cover the conservation of FGR (reported by 41 countries) and the use of FGR (34), and to a lesser extent the development of FGR (26) (Figure 25).

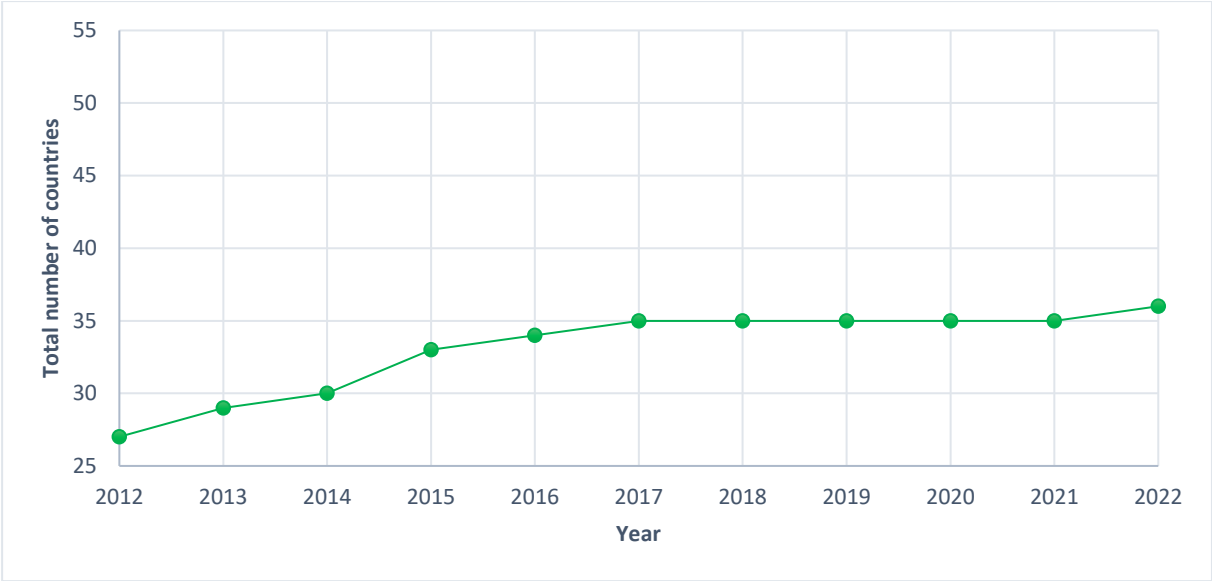


Figure 24. Development of national (or subnational) strategies for FGR conservation and use.

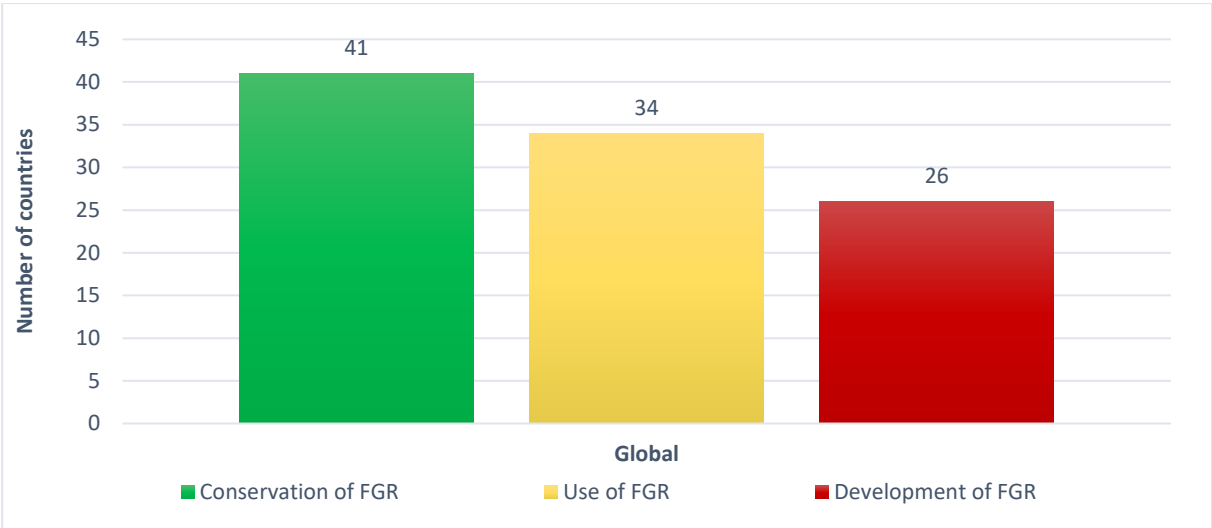


Figure 25. Areas of work covered by national (or subnational) strategies for FGR conservation and use.

Indicator A.4.3: Extent to which national strategies contribute to the implementation of regional or subregional FGR conservation strategies

38. Of those 43 countries that have a national FGR strategy, 25 countries reported that their strategy is aligned with regional (or subregional) FGR conservation strategies (Figure 26). Another nine countries reported that a process for aligning their national strategy with a regional (or subregional) FGR conservation strategy has been initiated. The list of countries whose national FGR strategies contribute to the implementation of a regional (or subregional) strategy is presented in Table 11.

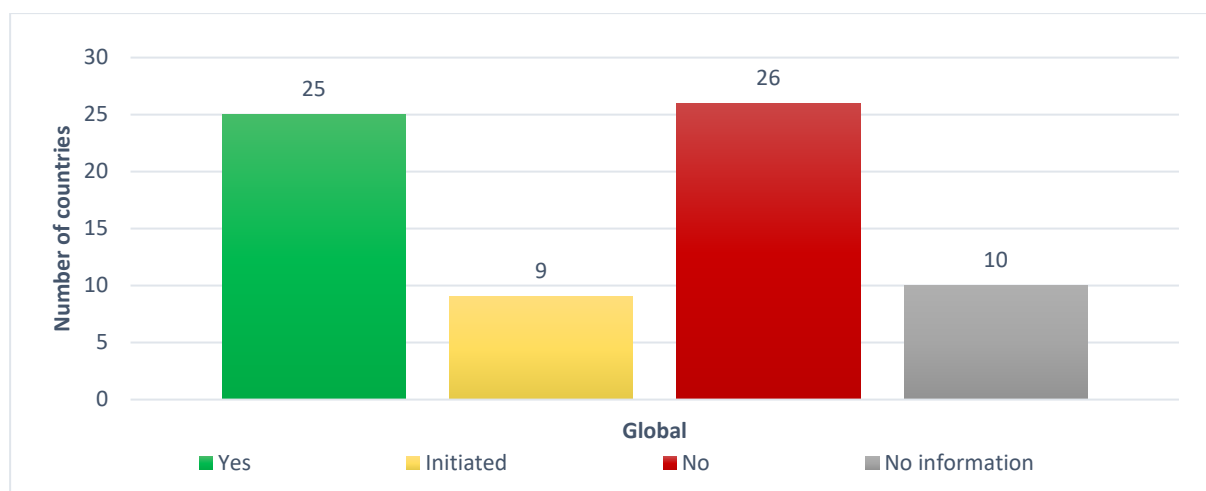


Figure 26. Number of countries whose national FGR strategies contribute to the implementation of a regional or subregional FGR conservation strategies.

Table 11. List of countries whose national FGR strategy contributes to the implementation of a regional or subregional FGR conservation strategy.

| Region | Countries |
|-------------------|--|
| Africa | Ethiopia, Guinea, Niger, Zimbabwe |
| Asia | China, India, Indonesia, Japan, Republic of Korea, Lao People's Democratic Republic, Malaysia |
| Europe | Czechia, Finland, France, Germany, Italy, Luxembourg, Malta, Norway, Slovenia, Sweden, Türkiye |
| Latin America | - |
| Near East | Yemen |
| North America | United States of America |
| Southwest Pacific | Cook Islands |

IV. STATE OF CONSERVATION, USE AND DEVELOPMENT OF FOREST GENETIC RESOURCES

39. The state of conservation, use and development of FGR as a follow-up to the Global Plan of Action is also tracked by four targets and ten indicators (see Part B of the questionnaire in *Appendix I*). Of the 73 reporting countries, six did not provide any species-specific data and information, and cited a lack of, or limited availability of, species-specific data as a reason for not filling in this part of the questionnaire. Another six countries provided the species-specific data for less than five species. The findings are presented in the following sections based on Targets B.1, B.2, B.3 and B.4, and related indicators and verifiers. For species-specific verifiers, it is not meaningful to provide in this document all lists of species reported by countries, so this information is summarized with the number of species reported at the global and regional levels. The complete lists of species reported by each country will be available from the new global information system on FGR that is currently under development.

TARGET B.1: FOREST GENETIC RESOURCES ARE REGULARLY ASSESSED AND CHARACTERIZED

Indicator B.1.1: Assessment of FGR

| | |
|---|-------|
| Number of species* for which an up-to-date national distribution range is available: | 2 044 |
|---|-------|

* Net number of species reported globally

Table 12. Number of species, by region, for which an up-to-date national distribution range is available.

| Region | Number of species* |
|---------------------------------|--------------------|
| Africa | 602 |
| Asia | 449 |
| Europe | 464 |
| Latin America and the Caribbean | 379 |
| Near East | 51 |
| North America | 268 |
| Southwest Pacific | 134 |

* Net number of species reported by region

Indicator B.1.2: Characterization of FGR

| | |
|--|-------|
| Number of species* that have been characterized based on non-molecular information (e.g. provenance trials, ecological or climatic zonation): | 1 573 |
|--|-------|

* Net number of species reported globally

Table 13. Number of species, by region, that have been characterized based on non-molecular information.

| Region | Number of species* |
|---------------------------------|--------------------|
| Africa | 531 |
| Asia | 390 |
| Europe | 200 |
| Latin America and the Caribbean | 516 |
| Near East | 32 |
| North America | 85 |
| Southwest Pacific | 42 |

* Net number of species reported by region

| | |
|---|-----|
| Number of species* that have been characterized based on molecular information (e.g. range-wide sampling of populations for molecular marker studies): | 731 |
|---|-----|

* Net number of species reported globally

Table 14. Number of species, by region, that have been characterized based on molecular information.

| Region | Number of species* |
|---------------------------------|---------------------------|
| Africa | 35 |
| Asia | 368 |
| Europe | 135 |
| Latin America and the Caribbean | 138 |
| Near East | 10 |
| North America | 91 |
| Southwest Pacific | 45 |

* Net number of species reported by region

TARGET B.2: FOREST GENETIC RESOURCES ARE CONSERVED *IN SITU*, AND COMPLEMENTARY *EX SITU* MEASURES HAVE BEEN IMPLEMENTED

Indicator B.2.1: Amount of FGR conserved *in situ*

| | |
|---|-------|
| Number of species* included in <i>in situ</i> conservation programmes: | 1 285 |
|---|-------|

* Net number of species reported globally

Table 15. Number of species, by region, included in *in situ* conservation programmes.

| Region | Number of species* |
|---------------------------------|---------------------------|
| Africa | 159 |
| Asia | 337 |
| Europe | 208 |
| Latin America and the Caribbean | 470 |
| Near East | 36 |
| North America | 117 |
| Southwest Pacific | 47 |

* Net number of species reported by region

Table 16. Number of *in situ* conservation units and their area (in hectares) for the five most commonly conserved species by region.

| Region | Species | No. of <i>in situ</i> units | Area (ha) |
|---------------------------------|---------------------------------|-----------------------------|------------|
| Africa | <i>Azelia africana</i> | 70 | 9 660 |
| | <i>Cassia sieberiana</i> | 30 | 35 |
| | <i>Faidherbia albida</i> | 26 | 60 |
| | <i>Quercus suber</i> | 35 | 3 500 |
| | <i>Senegalia senegal</i> | 84 | 406 327 |
| Asia | <i>Pinus densiflora</i> | 145 | 112 697 |
| | <i>Quercus mongolica</i> | 76 | 11 778 |
| | <i>Taxus cuspidata</i> | 105 | 13 172 |
| | <i>Tectona grandis</i> | 227 | 15 634 |
| | <i>Tilia mandshurica</i> | 105 | 8 242 |
| Europe | <i>Fagus sylvatica</i> | 1 599 | 114 792 |
| | <i>Picea abies</i> | 1 171 | 106 473 |
| | <i>Pinus sylvestris</i> | 2 009 | 171 163 |
| | <i>Quercus petraea</i> | 756 | 33 218 |
| | <i>Quercus robur</i> | 2 608 | 82 751 |
| Latin America and the Caribbean | <i>Andira fraxinifolia</i> | 330 | 27 522 202 |
| | <i>Calophyllum brasiliense</i> | 270 | 25 877 777 |
| | <i>Cedrela fissilis</i> | 219 | 11 411 974 |
| | <i>Podocarpus salignus</i> | 1 700 | - |
| | <i>Simarouba amara</i> | 242 | 13 887 857 |
| Near East | <i>Cedrus libani</i> | 7 | - |
| | <i>Pistacia palaestina</i> | 8 | - |
| | <i>Quercus coccifera</i> | 9 | - |
| | <i>Quercus infectoria</i> | 9 | - |
| | <i>Styrax officinalis</i> | 7 | - |
| North America | <i>Pinus contorta</i> | 69 | 3 575 434 |
| | <i>Pinus ponderosa</i> | 66 | 1 306 584 |
| | <i>Prunus serotina</i> | 62 | 790 525 |
| | <i>Pseudotsuga menziesii</i> | 81 | 3 881 636 |
| | <i>Quercus alba</i> | 62 | 860 419 |
| Southwest Pacific | <i>Quercus rubra</i> | 67 | 1 093 102 |
| | <i>Agathis macrophylla</i> | - | 229 |
| | <i>Endospermum macrophyllum</i> | - | 229 |
| | <i>Intsia bijuga</i> | - | 487 |
| | <i>Pinus caribaea</i> | - | 1 873 |
| | <i>Santalum yasi</i> | - | 536 |

Indicator B.2.2: Amount of FGR conserved *ex situ*

| | |
|---|-----|
| Number of species* included in <i>ex situ</i> conservation programmes: | 987 |
|---|-----|

* Net number of species reported globally

Table 17. Number of species, by regions, included in *ex situ* conservation programmes.

| Region | Number of species* |
|---------------------------------|---------------------------|
| Africa | 140 |
| Asia | 403 |
| Europe | 159 |
| Latin America and the Caribbean | 205 |
| Near East | 1 |
| North America | 202 |
| Southwest Pacific | 52 |

* Net number of species reported by region

Table 18. Number of *ex situ* conservation units, their area (in hectares) and the number of *ex situ* accessions (in seed and clone banks) for the five most commonly conserved species by region.

| Region | Species | No. of <i>ex situ</i> units | Area (ha) | No. of <i>ex situ</i> accessions |
|---------------------------------|-----------------------------------|-----------------------------|-----------|----------------------------------|
| Africa | <i>Bismarckia nobilis</i> | 81 | 5 000 | 5 000 |
| | <i>Dyopsis decaryi</i> | 73 | - | 400 |
| | <i>Dyopsis lutescens</i> | 90 | - | 10 000 |
| | <i>Eucalyptus grandis</i> | 66 | 102 | - |
| | <i>Pinus patula</i> | 86 | 94 | 2 |
| Asia | <i>Chamaecyparis obtusa</i> | 89 | 269 | 5 603 |
| | <i>Cryptomeria japonica</i> | 263 | 777 | 16 046 |
| | <i>Eucalyptus camaldulensis</i> | 257 | 413 | 189 |
| | <i>Tectona grandis</i> | 89 | 2 165 | 1 062 |
| | <i>Vachellia nilotica</i> | 150 | 35 | 750 |
| Europe | <i>Fagus sylvatica</i> | 522 | 52 916 | 104 |
| | <i>Larix decidua</i> | 324 | 2 935 | 903 |
| | <i>Picea abies</i> | 557 | 4 728 | 3 390 |
| | <i>Pinus sylvestris</i> | 4 366 | 54 523 | 6 847 |
| | <i>Quercus robur</i> | 595 | 5 222 | 1 319 |
| Latin America and the Caribbean | <i>Eucalyptus globulus</i> | 136 | 432 | 10 |
| | <i>Eucalyptus grandis</i> | 84 | 73 | 120 |
| | <i>Eucalyptus nitens</i> | 70 | 181 | 5 |
| | <i>Pinus radiata</i> | 159 | 647 | 6 |
| | <i>Populus deltoides</i> | 119 | 37 | - |
| Near East | (no species reported) | - | - | - |
| North America | <i>Juglans cinerea</i> | - | - | 639 |
| | <i>Picea glauca</i> | - | - | 2 872 |
| | <i>Picea glauca x engelmannii</i> | - | - | 1 189 |
| | <i>Picea mariana</i> | - | - | 1 469 |
| | <i>Pseudotsuga menziesii</i> | - | - | 1 244 |
| Southwest Pacific | <i>Pinus caribaea</i> | 6 | 28 000 | - |
| | <i>Santalum austrocaledonicum</i> | 150 | 2 | 5 |
| | <i>Santalum yasi</i> | 3 | 1 | - |
| | <i>Swietenia macrophylla</i> | 14 | 41 325 | - |

TARGET B.3: USE AND DEVELOPMENT OF FGR ARE ENHANCED**Indicator B.3.1: Species included in tree seed and breeding programmes (including international breeding cooperation and efforts carried out by the private sector)**

| | |
|--|-----|
| Number of species* included in national tree seed programmes: | 700 |
|--|-----|

* Net number of species reported globally

Table 19. Number of species, by region, included in national tree seed programmes.

| Region | Number of species* |
|---------------------------------|---------------------------|
| Africa | 159 |
| Asia | 149 |
| Europe | 171 |
| Latin America and the Caribbean | 122 |
| North America | 100 |
| Southwest Pacific | 127 |

* Net number of species reported by region

| | |
|---|-----|
| Number of species* included in tree breeding programmes: | 477 |
|---|-----|

* Net number of species reported globally

Table 20. Number of species, by region, included in tree breeding programmes.

| Region | Number of species* |
|---------------------------------|---------------------------|
| Africa | 86 |
| Asia | 185 |
| Europe | 112 |
| Latin America and the Caribbean | 98 |
| North America | 69 |
| Southwest Pacific | 51 |

* Net number of species reported by region

Indicator B.3.2: Production of forest reproductive material**Table 21.** Number of seed stands and their area (in hectares) for the five most commonly reported species by region.

| Region | Species | No. of seed stands | Area of seed stands (ha) |
|---------------------------------|-----------------------------------|--------------------|--------------------------|
| Africa | <i>Azelia africana</i> | 92 | 65 |
| | <i>Azelia bella</i> | 37 | 145 |
| | <i>Eucalyptus grandis</i> | 27 | 62 |
| | <i>Pterocarpus erinaceus</i> | 79 | 85 |
| | <i>Quercus suber</i> | 28 | 3 030 |
| Asia | <i>Chamaecyparis obtusa</i> | 1 631 | 5 282 |
| | <i>Cryptomeria japonica</i> | 3 586 | 8 384 |
| | <i>Dalbergia cochinchinensis</i> | 308 | 198 |
| | <i>Pterocarpus macrocarpus</i> | 212 | 65 |
| | <i>Tectona grandis</i> | 277 | 7 186 |
| Europe | <i>Fagus sylvatica</i> | 7 494 | 461 881 |
| | <i>Picea abies</i> | 7 169 | 99 645 |
| | <i>Pinus sylvestris</i> | 13 800 | 387 613 |
| | <i>Quercus petraea</i> | 4 292 | 172 361 |
| | <i>Quercus robur</i> | 6 400 | 339 544 |
| Latin America and the Caribbean | <i>Carya illinoensis</i> | 12 | 24 |
| | <i>Pinus ponderosa</i> | 17 | 200 |
| | <i>Pinus taeda</i> | 17 | 303 |
| | <i>Populus deltoides</i> | 119 | 37 |
| | <i>Prosopis alba</i> | 12 | 3 250 |
| | <i>Salix nigra</i> | 15 | 5 |
| Near East | (no species reported) | - | - |
| North America | <i>Betula alleghaniensis</i> | 40 | - |
| Southwest Pacific | <i>Santalum austrocaledonicum</i> | 6 | 2 |

Table 22. Number of seed orchards and their area (in hectares) for the five most commonly reported species by region.

| Region | Species | No. of seed orchards | Area (ha) |
|---------------------------------|-----------------------------------|----------------------|-----------|
| Africa | <i>Azelia africana</i> | 39 | 158 |
| | <i>Eucalyptus grandis</i> | 60 | 58 |
| | <i>Pinus eliottii</i> | 65 | 62 |
| | <i>Pinus kesiya</i> | 61 | 63 |
| | <i>Pinus patula</i> | 82 | 115 |
| Asia | <i>Chamaecyparis obtusa</i> | 152 | 299 |
| | <i>Cryptomeria japonica</i> | 224 | 296 |
| | <i>Dalbergia sissoo</i> | 64 | 678 |
| | <i>Eucalyptus tereticornis</i> | 139 | 519 |
| | <i>Tectona grandis</i> | 83 | 5 540 |
| Europe | <i>Larix decidua</i> | 154 | 634 |
| | <i>Picea abies</i> | 254 | 2 773 |
| | <i>Pinus nigra</i> | 92 | 639 |
| | <i>Pinus sylvestris</i> | 654 | 7 948 |
| | <i>Quercus robur</i> | 157 | 1 184 |
| Latin America and the Caribbean | <i>Eucalyptus globulus</i> | 15 | 74 |
| | <i>Eucalyptus nitens</i> | 21 | 86 |
| | <i>Pinus eliottii</i> | 17 | 97 |
| | <i>Pinus radiata</i> | 14 | 136 |
| | <i>Pinus taeda</i> | 23 | 85 |
| Near East | (no species reported) | - | - |
| North America | <i>Picea glauca</i> | 232 | - |
| | <i>Picea glauca x engelmannii</i> | 82 | - |
| | <i>Picea mariana</i> | 119 | - |
| | <i>Pinus banksiana</i> | 156 | - |
| | <i>Tsuga heterophylla</i> | 52 | - |
| Southwest Pacific | <i>Eucalyptus cladocalyx</i> | 15 | 19 |
| | <i>Eucalyptus dunnii</i> | 13 | 27 |
| | <i>Eucalyptus globulus</i> | 20 | 54 |
| | <i>Eucalyptus nitens</i> | 14 | 28 |
| | <i>Eucalyptus polybractea</i> | 18 | 17 |

Table 23. Amount (average number per year) of planting stock produced through macro and/or micropropagation for the five most commonly reported species by region.

| Region | Species | Planting stock produced per year |
|---------------------------------|---------------------------------------|---|
| Africa | <i>Casuarina equisetifolia</i> | 20 007 000 |
| | <i>Cupressus lusitanica</i> | 10 711 400 |
| | <i>Eucalyptus grandis</i> | 140 765 600 |
| | <i>Pinus halepensis</i> | 12 000 000 |
| | <i>Pinus patula</i> | 94 700 610 |
| Asia | <i>Casuarina equisetifolia</i> | 2 500 000 |
| | <i>Casuarina junghuhniana</i> | 2 500 000 |
| | <i>Cryptomeria japonica</i> | 11 330 000 |
| | <i>Eucalyptus camaldulensis</i> | 37 000 000 |
| | <i>Leucaena leucocephala</i> | 5 000 000 |
| Europe | <i>Fagus sylvatica</i> | 138 504 626 |
| | <i>Picea abies</i> | 837 638 655 |
| | <i>Pinus sylvestris</i> | 741 968 148 |
| | <i>Quercus petraea</i> | 108 595 074 |
| | <i>Quercus robur</i> | 251 109 470 |
| Latin America and the Caribbean | <i>Eucalyptus globulus</i> | 27 484 000 |
| | <i>Eucalyptus grandis</i> | 2 981 550 |
| | <i>Eucalyptus grandis x urophylla</i> | 1 357 654 |
| | <i>Eucalyptus nitens</i> | 12 000 000 |
| | <i>Pinus radiata</i> | 60 916 000 |
| Near East | <i>(no species reported)</i> | - |
| North America | <i>(no species reported)</i> | - |
| Southwest Pacific | <i>Agathis macrophylla</i> | 5 939 |
| | <i>Intsia bijuga</i> | 34 478 |
| | <i>Santalum austrocaledonicum</i> | 20 000 |
| | <i>Santalum yasi</i> | 9 711 |
| | <i>Tectona grandis</i> | 28 111 |

Indicator B.3.3: State of tree breeding programmes**Table 24.** Generation number of the most advanced breeding programmes reported for selected species/hybrids.

| Top 20 species/hybrids | Generation number |
|------------------------------------|--------------------------|
| <i>Abies alba</i> | 4 |
| <i>Alnus orientalis</i> | 4 |
| <i>Beilschmiedia mannii</i> | 4 |
| <i>Eucalyptus globulus</i> | 4 |
| <i>Eucalyptus grandis</i> | 4 |
| <i>Moringa oleifera</i> | 4 |
| <i>Pinus radiata</i> | 4 |
| <i>Populus</i> × <i>canadensis</i> | 4 |
| <i>Populus nigra</i> | 4 |
| <i>Rhizophora harrisonii</i> | 4 |
| <i>Rhizophora mangle</i> | 4 |
| <i>Rhizophora racemosa</i> | 4 |
| <i>Tectona grandis</i> | 4 |
| <i>Terminalia ivorensis</i> | 4 |
| <i>Terminalia superba</i> | 4 |
| <i>Triplochiton scleroxylon</i> | 4 |
| <i>Ulmus glabra</i> | 4 |
| <i>Ulmus minor</i> | 4 |
| <i>Azelia bella</i> | 3 |
| <i>Castanea sativa</i> | 3 |
| <i>Cunninghamia lanceolata</i> | 3 |
| <i>Cupressus lusitanica</i> | 3 |
| <i>Cupressus sempervirens</i> | 3 |
| <i>Cunninghamia lanceolata</i> | 3 |
| <i>Cupressus lusitanica</i> | 3 |
| <i>Cupressus sempervirens</i> | 3 |
| <i>Eucalyptus nitens</i> | 3 |
| <i>Eucalyptus tereticornis</i> | 3 |
| <i>Eucalyptus urophylla</i> | 3 |
| <i>Gmelina arborea</i> | 3 |
| <i>Khaya ivorensis</i> | 3 |
| <i>Pinus pinaster</i> | 3 |
| <i>Pinus taeda</i> | 3 |
| <i>Populus deltoides</i> | 3 |
| <i>Xylopia aethiopica</i> | 3 |

TARGET B.4: POLICIES AND CAPACITIES SUPPORTING FGR CONSERVATION AND SUSTAINABLE USE ARE STRENGTHENED

Indicator B.4.1: Integration of FGR conservation and use into relevant national policies

40. Globally, 51 countries reported having integrated FGR conservation and use into national forest programmes and/or national forest policies, and nine countries reported having initiated a process for this (Figure 27). Four countries reported that this is not done because the country does not have a national forest programme and/or national forest policy. The list of countries with FGR conservation and use integrated into national forest programmes and/or national forest policies is presented in Table 25.

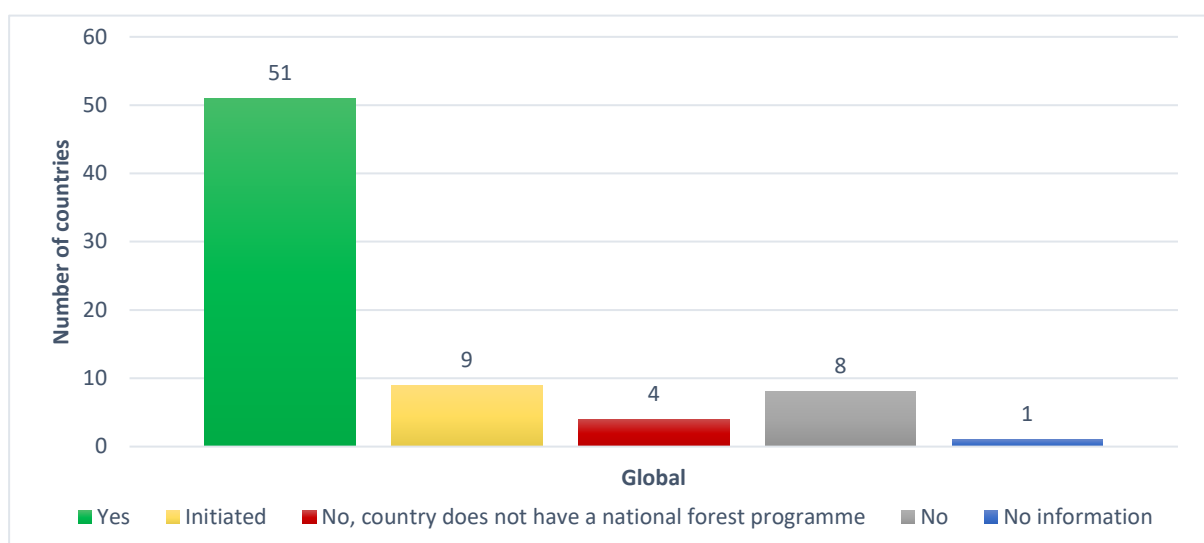


Figure 27. Number of countries with FGR conservation and use integrated into national forest programmes and/or national forest policies.

Table 25. List of countries that have integrated FGR conservation and use into their national forest programme and/or national forest policy.

| Region | Countries |
|-------------------|--|
| Africa | Burkina Faso, Eswatini, Ethiopia, Guinea, Kenya, Madagascar, Mali, Namibia, Niger, Nigeria, South Africa, Zimbabwe |
| Asia | China, India, Indonesia, Japan, Republic of Korea, Lao People's Democratic Republic, Malaysia, Sri Lanka, Thailand |
| Europe | Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Hungary, Ireland, Italy, Lithuania, Luxembourg, Malta, Norway, Portugal, Slovenia, Spain, Switzerland, Türkiye, Ukraine |
| Latin America | Argentina, Ecuador, Saint Lucia |
| Near East | Lebanon |
| North America | Canada |
| Southwest Pacific | Australia, Vanuatu |

41. A total of 56 countries reported having integrated FGR conservation and use into national biodiversity action plans and/or related policies, and five countries reported having initiated a process

for this (Figure 28). Four countries reported that this is not done because the country does not have a national biodiversity action plan. The list of countries with FGR conservation and use integrated into their national biodiversity action plans and/or related policies is presented in Table 26.

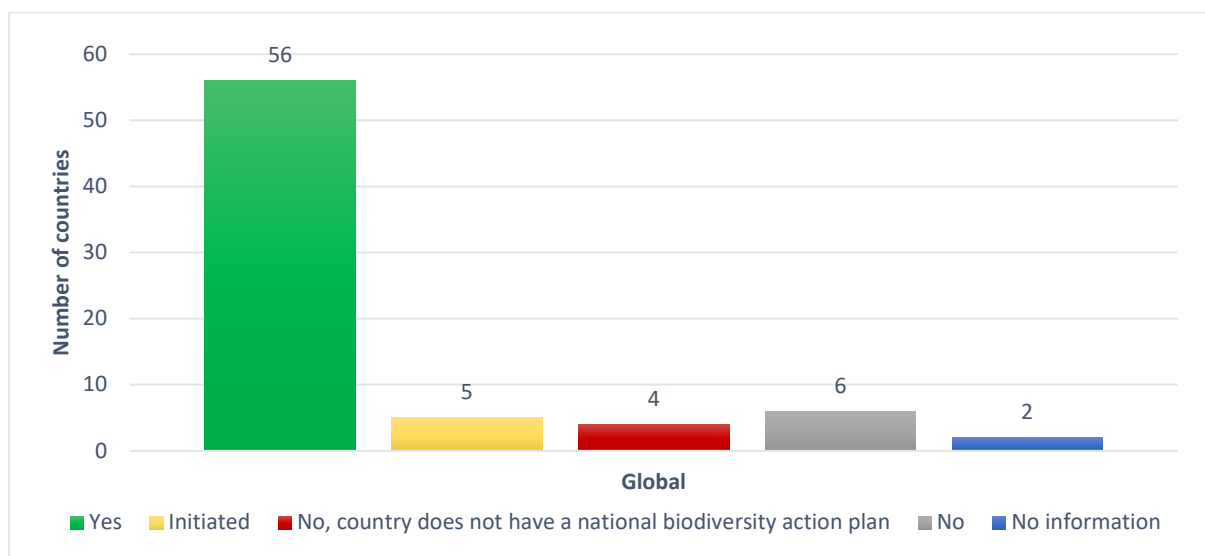


Figure 28. Number of countries with FGR conservation and use integrated into national biodiversity action plans and related policies.

Table 26. List of countries that have integrated FGR conservation and use into their national biodiversity action plans and/or related policies.

| Region | Countries |
|-------------------|--|
| Africa | Burkina Faso, Eswatini, Ethiopia, Guinea, Kenya, Madagascar, Mali, Mauritania, Morocco, Namibia, Niger, Nigeria, South Africa, Zimbabwe |
| Asia | China, India, Indonesia, Japan, Republic of Korea, Lao People's Democratic Republic, Malaysia, Sri Lanka, Thailand |
| Europe | Austria, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Georgia, Germany, Ireland, Italy, Luxembourg, Malta, Norway, Poland, Portugal, Russian Federation, Serbia, Spain, Switzerland, Türkiye |
| Latin America | Argentina, Chile, Mexico, Panama, Saint Lucia |
| Near East | Lebanon, Yemen |
| North America | Canada |
| Southwest Pacific | Australia, Fiji |

42. Globally, 37 countries reported having integrated FGR conservation and use into national adaptation strategies for climate change, and 16 countries reported having initiated a process for this (Figure 29). Four countries reported that this is not done because there is no national adaptation

strategy for climate change. The list of countries with FGR conservation and use integrated into national adaptation strategies for climate change is presented in Table 27.

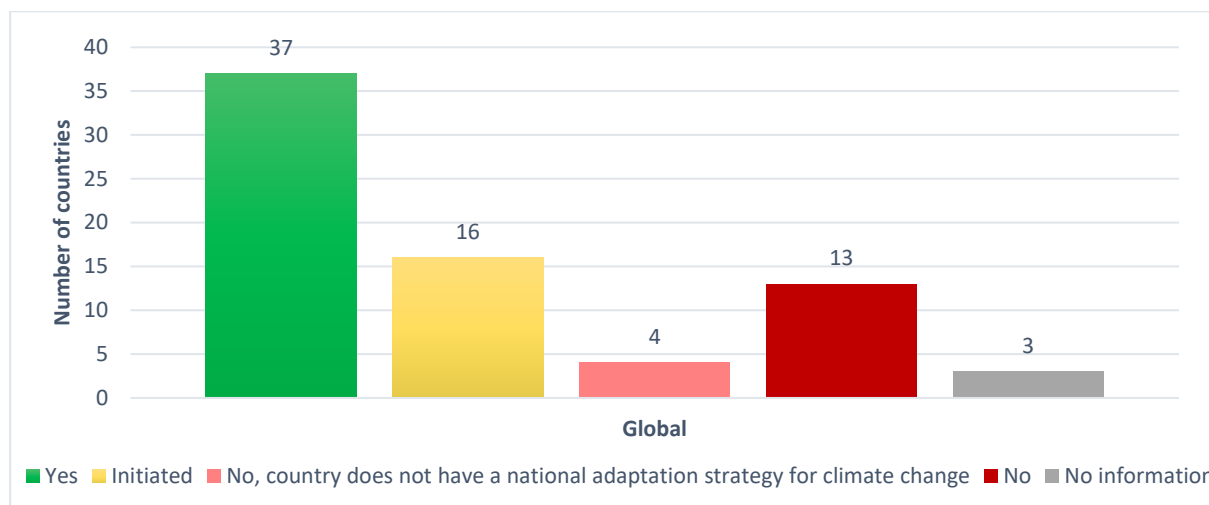


Figure 29. Number of countries with FGR conservation and use integrated national adaptation strategies for climate change.

Table 27. List of countries that have integrated FGR conservation and use into their national adaptation strategies for climate change.

| Region | Country |
|-------------------|--|
| Africa | Burkina Faso, Eswatini, Ethiopia, Guinea, Kenya, Mali, Morocco, Nigeria, South Africa |
| Asia | China, India, Indonesia, Japan, Republic of Korea, Malaysia, Sri Lanka |
| Europe | Belgium, Bulgaria, Cyprus, Czechia, Denmark, Estonia, Finland, France, Italy, Luxembourg, Malta, Norway, Poland, Spain, Sweden, Switzerland, Türkiye |
| Latin America | Chile |
| Near East | - |
| North America | Canada, United States of America |
| Southwest Pacific | Fiji |

Indicator B.4.2: Participation in regional/subregional collaboration on FGR

43. Globally, 54 countries reported participating in regional and/or subregional collaboration on FGR, and seven countries reported considering joining a regional or subregional network(s) on FGR (Figure 30). The list of countries participating in regional and/or subregional collaboration on FGR is presented in Table 28.

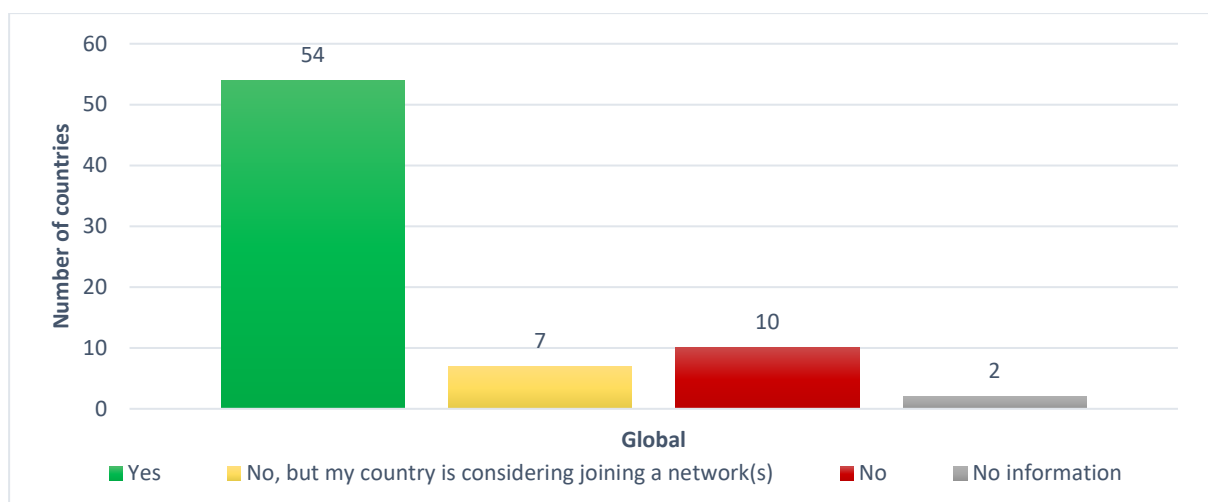


Figure 30. Number of country participating in regional and/or sub-regional networks on FGR.

Table 28. List of countries that are participating in regional and/or subregional networks on FGR.

| Region | Countries |
|-------------------|---|
| Africa | Burkina Faso, Ethiopia, Guinea, Kenya, Madagascar, Mali, Namibia, Niger, South Africa, Zimbabwe |
| Asia | China, India, Republic of Korea, Lao People's Democratic Republic, Malaysia, Sri Lanka, Thailand |
| Europe | Austria, Belgium, Croatia, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Lithuania, Luxembourg, Malta, Netherlands (Kingdom of the), Norway, Poland, Serbia, Slovenia, Spain, Sweden, Switzerland, Türkiye |
| Latin America | Brazil, Ecuador, Mexico, Saint Lucia |
| Near East | Lebanon, Yemen |
| North America | Canada, United States of America |
| Southwest Pacific | Australia, Cook Islands, Fiji |

Indicator B.4.3: Participation in international research and development cooperation on FGR

44. A total of 52 countries reported participating in international research and development (R&D) collaboration on FGR (Figure 31). Seven countries reported that they are not participating in international R&D cooperation on FGR but that their national organizations have sought opportunities for this. Another nine countries reported that their national organizations are currently not participating in international R&D cooperation but that have done so during the past five years (Figure 31). The list of countries participating in international R&D collaboration on FGR is presented in Table 29. The

number of participating national organizations per region ranged from four to 124 (Figure 32), and per country from one to 22.



Figure 31. Number of countries participating in international R&D collaboration on FGR.

Table 29. List of countries that are participating in international R&D cooperation on FGR.

| Region | Country |
|-------------------|--|
| Africa | Burkina Faso, Ethiopia, Guinea, Kenya, Madagascar, Mali, Morocco, Namibia, South Africa, Zimbabwe |
| Asia | China, India, Japan, Republic of Korea, Malaysia, Thailand |
| Europe | Austria, Belgium, Croatia, Czechia, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Lithuania, Malta, Netherlands (Kingdom of the), Norway, Russian Federation, Serbia, Slovenia, Spain, Sweden, Switzerland, Türkiye |
| Latin America | Argentina, Brazil, Ecuador, Mexico, Saint Lucia |
| Near East | Lebanon, Yemen |
| North America | Canada, United States of America |
| Southwest Pacific | Australia, Fiji, Vanuatu |

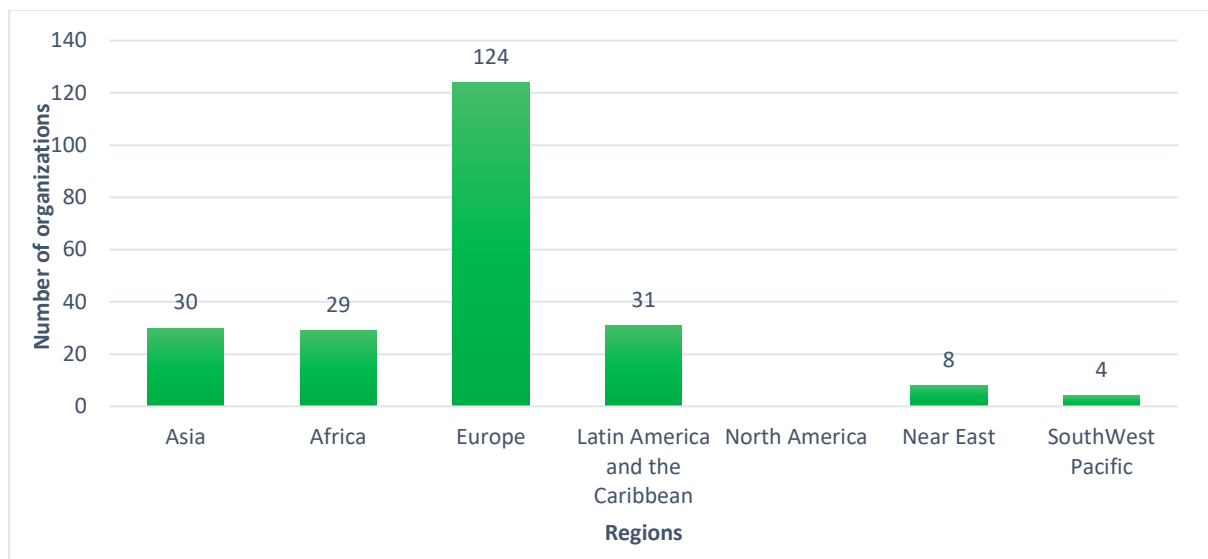


Figure 32. Number of national organizations currently participating in international research and development collaboration on FGR in different regions (North America did not report the number of organizations).

V. CONTRIBUTIONS FROM REGIONAL NETWORKS AND INTERNATIONAL ORGANIZATIONS

45. APFORGEN and EUFORGEN are regional networks on FGR operating in Asia-Pacific and Europe, respectively. APFORGEN was established in 2003 through a collaborative initiative by the Asia Pacific Association of Forestry Research Institutions (APAFRI), the International Plant Genetic Resources Institute (IPGRI, currently the Alliance of Bioversity International and the Center for International Tropical Agriculture, Alliance for short) and FAO. In 2014, APFORGEN developed a regional strategy to support the implementation of the Global Plan of Action in the network's member countries. The regional strategy was updated in 2017 and also presented to the 27th Session of the FAO Asia-Pacific Forestry Commission. Currently, the APFORGEN Secretariat is hosted by the Chinese Academy of Forestry.

46. EUFORGEN was established by IPGRI in technical collaboration with FAO in 1994 to implement a resolution on FGR made by the first Ministerial Conference on the Protection of Forests in Europe (MCPFE, now called Forest Europe). Since then, the Forest Europe process has frequently reaffirmed the role of EUFORGEN in facilitating regional collaboration on FGR. In 2015, EUFORGEN released a pan-European strategy for the genetic conservation of forest trees and established a core network of dynamic conservation units. Since 2017, EUFORGEN is coordinated by the European Forest Institute (EFI). Bioversity International was established in 1974 as the International Board for Plant Genetic Resources (IBPGR) and in 2019, it created an alliance with CIAT to continue delivering research-based solutions to harness agricultural biodiversity and sustainably transform food systems to improve people's lives. Through interdisciplinary research conducted globally, Bioversity is focusing in building an evidence base, decision support tools and capacity to support safeguarding and sustainable use of diverse forest resources, as well as resilient restoration of degraded landscapes using tree diversity.

47. BGCi was established in 1987 to create a global network of botanic gardens for plant conservation and currently it has members in more than 100 countries around the world. BGCi connects living plant collections, seed banks, glass houses and tissue culture infrastructures, as well as technical knowledge networks covering all aspects of plant conservation policy, practice and education. RBG, founded in 1759, operates botanic gardens in London and Sussex, and it also carries out research around the world to better understand and protect plants and fungi. RBG houses the

largest botanical and mycological collections in the world and it has developed botanical databases for plants and fungi. In addition to laboratories, its research facilities include a research station in Madagascar and the Millennium Seed Bank in Sussex.

48. World Agroforestry was established in 1978 as the International Center for Research in Agroforestry (ICRAF) to promote research on this topic in developing countries. A genetic resources unit was created in 1990 and the work on FGR was further strengthened by the establishment of the ICRAF genebank in 1997. ICRAF joined forces with the Center for International Forestry Research (CIFOR) in 2019 and currently trees and FGR remain as one of the research themes of CIFOR-ICRAF.

49. APFORGEN, Bioversity, BGCI, EUFORGEN, RBG and World Agroforestry reported contributions to all four priority areas of the Global Plan of Action. Their main activities are highlighted below by the four priority areas.

Improving the availability of, and access to, information on forest genetic resources (Priority Area 1)

50. The two regional networks have continued developing or maintaining regional information systems on FGR. In Asia, the APFORGEN member countries collaborated in the context of the APFORGIS project (Establishing an Information System for Conserving Native Tree Species and Their Genetic Resources in Asia-Pacific) between 2017 and 2019. The project brought together 11 institutions and over 60 experts from 16 countries to improve the availability of information on native Asian tree species and their conservation status. The project partners developed range-wide distribution, threat, and priority action maps for 63 native and socio-economically important Asian tree species. The maps and other data on these tree species were made available through the Tree Diversity information system¹⁴.

51. In Europe, EUFORGEN has continued maintaining the European Information System on Forest Genetic Resources (EUFGIS)¹⁵, which supports countries in identifying gaps in the genetic conservation of forest trees and in setting priorities for filling these gaps in the conservation efforts. Currently EUFGIS contains information on nearly 3 500 genetic conservation units of 112 tree species in 35 European countries.

52. Bioversity has supported the identification of priority tree species at local, national and regional level based on a combination of biological and socio-economic factors, and generated information on the spatial distribution of threats to these species and in particular to their genetic diversity. During the past 10 years, Bioversity and its research partners have conducted several multi-species threat analyses have been conducted in tropical Asia, Central Africa and South America, for example.¹⁶ Bioversity has also conducted species-specific threat analyses in different countries, such as Burkina Faso and Peru.¹⁷

¹⁴ <https://www.tree-diversity.org/>

¹⁵ <http://portal.eufgis.org/>

¹⁶ Gaisberger, H., et al., 2022. Tropical and subtropical Asia's valued tree species under threat. *Conservation Biology*, 36(3): p.e13873; Ceccarelli, V., et al., 2022. Vulnerability mapping of 100 priority tree species in Central Africa to guide conservation and restoration efforts. *Biological Conservation*, 270, p.109554; van Zonneveld, M., et al., 2018. Tree genetic resources at risk in South America: A spatial threat assessment to prioritize populations for conservation. *Diversity and Distributions*, 718–729.

¹⁷ Lompo, D., et al., 2020. Fine-scale spatial genetic structure, mating, and gene dispersal patterns in *Parkia biglobosa* populations with different levels of habitat fragmentation. *Applications in Plant Sciences*, 107(7), 1041–1053; Chiriboga-Arroyo, F., et al., 2021. Genetic threats to the Forest Giants of the Amazon: Habitat degradation effects on the socio-economically important Brazil nut tree (*Bertholletia excelsa*). *Plants, People, Planet*, 3(2): 194–210.

53. Since 2018, BGCi has led the Global Tree Assessment initiative,¹⁸ which aims to assess the conservation status of all the world's known tree species by 2023. For this purpose, BGCi maintains several databases, including GlobalTreeSearch,¹⁹ which provides the most comprehensive list of tree species and their natural distribution. In 2021, BGCi also launched the Global Tree Portal²⁰ to visualize the data gathered by the Global Tree Assessment project and to provide practitioners and policymakers with access to the most comprehensive data for informed conservation action.

54. Under this priority area, RBG reported carrying out 16 projects in 19 countries worldwide. These projects have contributed, for example, to the establishment and/or strengthening of national FGR assessment, characterization and monitoring systems (in Bolivia, Burkina Faso, Dominican Republic, Mexico, Mozambique, Mali, Niger and the United Kingdom of Great Britain and Northern Ireland) and to the reinforcement of FGR information systems to cover available scientific and traditional knowledge on the uses, distribution, habitats, biology and genetic variation of tree species (in Ghana and Zambia). RBG has also continued maintaining the Plants of the World Online database.²¹

55. As part of the CGIAR Research Program on Forests, Trees and Agroforestry (2011-2021), World Agroforestry created the Agroforestry Species Switchboard²² and the Global Tree Knowledge Platform (GTKP)²³. The Switchboard provides access to more than 50 different web-based information sources on trees and other plants covering more than 172 000 plant species while GTKP contains a wide range of tree knowledge products. GTKP also provides access to maps modelling the effects of climate change on the distribution of tree species in Africa and Central America. Moreover, GTKP makes available guidelines and statistical tools that can assist users in performing their own analyses, or to find resources useful for the management of FGR.

Conservation of forest genetic resources (*in situ* and *ex situ*) (Priority Area 2)

56. APFORGEN and EUFORGEN also continued promoting regional collaboration for FGR conservation. In its strategy, APFORGEN has identified the genera *Dalbergia*, *Shorea* and *Tectona* as priorities for regional collaboration and, between 2018 and 2021, a regional project on conserving rosewood (*Dalbergia* spp.) genetic resources in Greater Mekong was implemented in Cambodia, Lao People's Democratic Republic and Viet Nam with national and international partners. Another project on selected *Dalbergia* species was also implemented in 2018–2022 under the APFORGEN umbrella to assess the genetic diversity of these species across the Asia-Pacific region. Moreover, APFORGEN established a working group in 2021 on the conservation and management of regionally important tree species that identified *Aquilaria* as an additional priority genus for regional collaboration.

57. The major recent achievement of EUFORGEN in this area was the preparation of updated indicators for *in situ* and *ex situ* genetic conservation and forest reproductive material.²⁴ These indicators are part of the pan-European criteria and indicators for sustainable forest management adopted by the Forest Europe process. During 2015–2019, EUFORGEN also prepared a decision-

¹⁸ <https://globaltreeassessment.org/>

¹⁹ www.bgci.org/globaltreesearch/

²⁰ <https://www.bgci.org/resources/bgci-databases/globaltree-portal/>

²¹ <https://powo.science.kew.org/>

²² <https://apps.worldagroforestry.org/products/switchboard/>

²³ <https://www.worldagroforestry.org/tree-knowledge>

²⁴ Lefèvre, F., Alia, R., Bakkebø Fjellstad, K., Graudal, L., Oggioni, S.D., Rusanen, M., Vendramin, G.G. & Bozzano, M. 2020. *Dynamic conservation and utilization of forest tree genetic resources: indicators for in situ and ex situ genetic conservation and forest reproductive material*. European Forest Genetic Resources Programme (EUFORGEN), European Forest Institute. http://www.euforgen.org/fileadmin/templates/euforgen.org/upload/Publications/Thematic_publications/EUFORGEN_IGR_4.6.pdf

support tool for the management of dynamic genetic conservation units of forest trees.²⁵ Moreover, EUFORGEN collaborated with the European networks on animal and plant genetic resources in the context of the GenRes Bridge project, which aimed to strengthen the conservation and sustainable use of genetic resources in Europe. As a result of the project, the cross-sectoral European genetic resources strategy was launched in 2021.²⁶ In conjunction with its release, EUFORGEN also launched a new regional strategy for FGR.²⁷

58. During the past decade, Bioversity has conducted a number of studies in Africa, Asia and Latin America to support the identification of priority areas for conserving FGR. The studies have focused on socio-economically important tree species, such as African mahogany (*Khaya* spp.) and locust bean (*Parkia biglobosa*), walnut (*Juglans regia*), earpod tree (*Enterolobium cyclocarpum*) and kapok tree (*Ceiba pentandra*).²⁸

59. In 2021, BGCI published the *State of the World's Trees* report,²⁹ which assessed the conservation actions in place for tree species and threats to them. The report found that over two-thirds of the world's nearly 60 000 tree species are found in at least one protected area and that about one-third of tree species are conserved in botanic gardens or seed banks. It also showed that 30 percent of all tree species are threatened with extinction. In addition, BGCI published another report³⁰ in 2021 presenting case studies from across the world to demonstrate the success of a range of conservation approaches.

60. RBG reported carrying out 17 projects contributing to the conservation of FGR in 19 countries worldwide. The projects have, for example, strengthened the contributions of primary forests and protected areas to the *in situ* conservation of FGR in Bolivia and promoted the establishment and development of *ex situ* conservation systems in Mexico. Moreover, they have strengthened the role of forests managed by indigenous and local communities in FGR conservation (in Bolivia and Mexico) and assessed the conservation status of rare, threatened and/or highly useful tree and woody plant species (e.g. in Bhutan, Ghana, Indonesia, Thailand and Zambia). In addition, RBG reported that its Millennium Seed Bank holds 16 065 accessions for at least 6 700 tree species.

61. The ICRAF Genebank in Nairobi, Kenya safeguards more than 6 000 seed accessions of 190 species. Another 17 000 accessions of more than 681 species are held in 49 field genebanks located in 18 countries in Africa, Asia and Latin America. All accessions are documented in the Genesys

²⁵ Rudow, A., Westergren, M., Buiteveld, J., Buriánek, V., Cengel, B., Cottrell, J., de Dato, G. *et al.* 2020. *Decision support tool for the management of dynamic genetic conservation units*. European Forest Genetic Resources Programme (EUFORGEN), European Forest Institute.

http://www.euforgen.org/fileadmin/bioversity/publications/pdfs/WG7_report_05.21_corr.pdf

²⁶ GenRes Bridge Project Consortium, ECPGR, ERF and EUFORGEN. 2021. *Genetic Resources Strategy for Europe*. European Forest Institute.

<http://www.genresbridge.eu/fileadmin/templates/Genres/Uploads/Documents/GRS4E.pdf>

²⁷ EUFORGEN. 2021. *Forest Genetic Resources Strategy for Europe*. European Forest Institute.

https://www.euforgen.org/fileadmin/templates/euforgen.org/upload/Publications/Thematic_publications/FGR_Strategy4Europe.pdf

²⁸ Pakull, B., *et al.*, 2019. Genetic diversity and differentiation among the species of African mahogany (*Khaya* spp.) based on a large SNP array. *Conservation Genetics*, 20(5): 1035–1044; Lompo, D., *et al.*, 2018.

Phylogeography of African locust bean (*Parkia biglobosa*) reveals genetic divergence and spatially structured populations in West and Central Africa. *Journal of Heredity*, 109(7): 811–824; Gaisberger, H., *et al.*, 2020.

Diversity under threat: connecting genetic diversity and threat mapping to set conservation priorities for *Juglans regia* L. populations in Central Asia. *Frontiers in Ecology and Evolution*, 8 (171): 1–18; Thomas, E., *et al.*, 2016.

Genetic diversity of *Enterolobium cyclocarpum* in Colombian seasonally dry tropical forest: implications for conservation and restoration. *Biodiversity and Conservation*, 26: 825–842; Bocanegra-González, K. T. *et al.*, 2018.

Genetic diversity of *Ceiba pentandra* in Colombian seasonally dry tropical forest: Implications for conservation and management. *Biological Conservation*, 227: 29–37.

²⁹ BGCI. 2021. *State of the World's Trees*. BGCI, Richmond. <https://www.bgci.org/wp/wp-content/uploads/2021/08/FINAL-GTARReportMedRes-1.pdf>

³⁰ BGCI & FFI. 2021. *Securing a future for the world's threatened trees – A global challenge*. BGCI, Richmond, UK. <https://www.bgci.org/wp/wp-content/uploads/2021/09/GTCReportMedRes-v2.pdf>

database of the Crop Trust. The ICRAF genebank has also sent over 700 accessions representing 165 tree species to the Svalbard Global Seed Vault in Norway. New collections and field gene banks are being established as part of ICRAF-implemented projects in Ethiopia and Rwanda with financial support from Norway and the Green Climate Fund, respectively.

Sustainable use, development and management of forest genetic resources (Priority Area 3)

62. APFORGEN experts conducted an analysis of tree seed programmes in four countries (India, Indonesia, Malaysia and the Philippines) that have set national targets for restoring a total of 47 million hectares of degraded lands by 2030.³¹ The study found that the supply of native tree seed is unable to meet the demand, and that there is lack of both quality control for the seed of the native tree species and information on the impacts of climate change on these species. As part of the regional project on rosewood genetic resources, APFORGEN experts also provided training on seed collection and seed marketing for over 50 forestry professionals and over 100 local community members and farmers in Cambodia, Lao People's Democratic Republic and Viet Nam.

63. Since 2018, EUFORGEN experts have also continued regional collaboration in this area. They gathered latest scientific evidence on genetic aspects related to the production and use of forest reproductive material and published a report on this topic.³²

64. Bioversity has promoted the use of FGR in forest and landscape restoration by releasing an online tool called Diversity for Restoration (D4R)³³ and by carrying out several studies³⁴ in this area. It has also carried out several studies on the effect of forest management on FGR in Africa and Latin America³⁵, for example.

65. In 2020, BGI initiated a project on responsible and effective exchange of plant material and data to support collaborative research and biodiversity conservation. The project aims at quantifying the levels of plant material and data exchanged between European and African organizations, identifying constraints to germplasm and data exchange, developing a digital platform for this exchange, and creating a mutually-agreed, peer-reviewed global mechanism for recognizing botanical research institutions that apply best practice access and benefit-sharing and biosafety procedures.

66. RBG reported carrying out 19 projects contributing to this priority area in over 20 countries worldwide. These projects have, for example, supported reforestation and restoration efforts through seed conservation and research (in Bolivia, Burkina Faso, Dominican Republic, Indonesia, Mali, Mexico and Niger) and enhanced the capacity of local communities to sustainably use native tree species (in Bhutan, Bolivia, Burkina Faso, Mali, Mexico, Mozambique, Niger and South Africa).

³¹ Bosshard, E., Jalonen, R., Kanchanarak, T., Yuskianti, V., Tolentino, Jr. E., Warriar, R.R., Krishnan, S. *et al.* 2021. Are tree seed systems for forest landscape restoration fit for purpose? An analysis of four Asian countries. *Diversity*, 13(11): 575. <https://doi.org/10.3390/d13110575>

³² Gömöry, D., Himanen K., Tollefsrud, M.M., Ugglá, C., Kraigher, H., Bordács, S., Alizoti, P. *et al.* 2021. *Genetic aspects in production and use of forest reproductive material: Collecting scientific evidence to support the development of guidelines and decision support tools*. European Forest Genetic Resources Programme (EUFORGEN), European Forest Institute. <http://www.euforgen.org/publications/publication/genetic-aspects-linked-to-production-and-use-of-forest-reproductive-material-frm>

³³ <https://www.diversityforrestoration.org/>

³⁴ Jalonen, R., *et al.* 2018. Forest and landscape restoration severely constrained by a lack of attention to the quantity and quality of tree seed: Insights from a global survey. *Conservation Letters*, 11(4): 1–9; Nef, D. P. *et al.*, 2021. Initial investment in diversity is the efficient thing to do for resilient forest landscape restoration. *Frontiers in Forests and Global Change*, 3: 152.

³⁵ Duminil, J. *et al.*, 2016. Relationships between population density, fine-scale genetic structure, mating system and pollen dispersal in a timber tree from African rainforests. *Heredity*, 116(3): 295–303; Alarcón-Méndez, M. *et al.*, 2023. Implications of community forest management for the conservation of the genetic diversity of big-leaf mahogany (*Swietenia macrophylla* King, Meliaceae) in the Maya Biosphere Reserve, Petén, Guatemala. *Trees, Forests and People*, 11: 100362.

Furthermore, the projects have reinforced national tree seed programmes in Brazil and Mexico, and supported climate change adaptation and mitigation through proper management and use of FGR in Bolivia and Uganda. RBG has also prepared several publications based on these projects, including a book on 110 multipurpose species in Botswana, Kenya, Mali, Mexico and South Africa.³⁶

67. World Agroforestry reported strengthening the delivery of planting material through the application of the Food Tree Portfolio Approach³⁷ in which suitable food tree species are promoted, combined with other plant foods, to supply required nutrients year-round and by developing Rural Resource Centres (RRCs)³⁸. The approach has been developed for 17 locations in East Africa and it has also been expanded to other regions. The RRCs are designed to train people in tree propagation, farm management and other skills. World Agroforestry has also worked on orphan tree crops by supporting breeding pathways with the African Orphan Crops Consortium (AOCC).³⁹ As of 2022, genomes of six tree species have been published and further nine are in progress. In Ethiopia, World Agroforestry has also promoted low-input tree breeding through its Provision of Adequate Tree Seed Portfolios (PATSPo)⁴⁰ project, which has established 30 breeding seedling orchards (BSOs) for 15 tree species prioritized by communities and the government, and registered more than 200 existing seed sources of mostly indigenous trees.

Policies, institutions and capacity building (Priority Area 4)

68. The regional networks have continued to facilitate regional and international cooperation on FGR and sharing of information on FGR management and research. For this purpose, APFORGEN organized 13 regional workshops and events in the Asia-Pacific region during the past decade. APFORGEN has also continued its capacity-building efforts through its Regional Training Centre, which organizes workshops and distance learning opportunities on the conservation and management of FGR for trainers, policymakers, forest managers and researchers. Between 2016 and 2018, the Regional Training Centre organized three training workshops for 105 trainees from 16 countries.

69. In Europe, EUFORGEN moved into its sixth Phase (2020–2024) and has continued as the platform for pan-European collaboration on FGR. One of its objectives also reaffirms the network's contributions to the implementation of the Global Plan of Action at regional level. Moreover, EUFORGEN has continued as a dissemination channel for several European research projects on FGR. In addition, it organized three training events in 2020–2021 for the EUFGIS national focal points.

70. Bioversity reported carrying out research on tree seed systems and identifying needs for the development of related policies, gaps in capacity and needs for strengthening of institutions in this regard in Asia, Africa and Latin America.⁴¹

³⁶ Ulian, T., Flores, C., Lira, R., Mamatsharaga, A., Mogotsi, K.K., Muthoka(†). F., Ngwako, S. et al., eds. 2019. *Wild plants for a sustainable future: 110 multipurpose species*. Royal Botanic Gardens, Kew, UK.

<https://www.kew.org/sites/default/files/2019-04/Sustainable%20wild%20plants.pdf>

³⁷ McMullin S. et al., 2019. Developing fruit tree portfolios that link agriculture more effectively with nutrition and health: A new approach for providing year-round micronutrients to smallholder farmers. *Food Security*, 11: 1355–1372.

³⁸ Takoutsing B. et al., 2014. Scaling-up sustainable land management practices through the concept of the rural resource centre: Reconciling farmers' interests with research agendas. *Journal of Agricultural Education and Extension*, 20: 463–483.

³⁹ Jamnadass R. et al., 2020. Enhancing African orphan crops with genomics. *Nature Genetics* 52: 356–360.

⁴⁰ <http://www.worldagroforestry.org/project/provision-adequate-tree-seed-portfolio-ethiopia>

⁴¹ Atkinson, R. J. et al., 2021. Seeding resilient restoration: An indicator system for the analysis of tree seed systems. *Diversity*, 13(8): 1–13; Bosshard, E. et al., 2021. Are tree seed systems for forest landscape restoration fit for purpose? An analysis of four Asian countries. *Diversity*, 13(11): 575; Valette, M. et al., 2020. Beyond fixes that fail: Identifying sustainable improvements to tree seed supply and farmer participation in forest and landscape restoration. *Ecology and Society*, 25(4): 1–26.

71. BGI and its partners have developed extensive training materials for tree red listing,⁴² seed conservation,⁴³ integrated species recovery⁴⁴ and ecological restoration.

72. RBG reported carrying out 21 projects contributing to this priority area in different parts of the world. Its projects have, for example, contributed to the development of national strategies for the conservation and use of FGR (in Bolivia, Ghana, the United Kingdom and Zambia) and to the strengthening of educational and research capacities on FGR (in Bolivia). The RBG projects have also promoted mechanisms for germplasm exchange at regional level to support research and development activities, in agreement with international conventions (in Ghana, Mexico and Zambia) and reinforced regional and international cooperation to support education, knowledge dissemination and research on FGR (in China, Mexico and the United Kingdom).

73. World Agroforestry reported conducting capacity building and institutional development as part of the Food Tree Portfolio Approach, AOCC, RRCs and PATSPO activities. The pilot projects in Kenya, Uganda and Ethiopia that scale up the portfolio approach have provided 6 000 farmers with training and supplied tree seedlings to 1 800 households, for example. It also reported continued work on tree seed supply systems and related policies and value chains.⁴⁵

VI. CONCLUSIONS

74. The overall findings of this Second Implementation Report confirm that progress has been made in the implementation of the Global Plan of Action. The number of the reporting countries increased from 44 to 73 when compared to the First Implementation Report prepared in 2018. This provides a more comprehensive picture of the progress made but it should be kept in mind that these 73 countries represent 68 percent of the countries that have so far nominated a NFP on FGR, and only 41 percent of the 179 member countries of the Commission. Many of the 44 countries that contributed to the First Implementation Report were able to report more data for this report. In addition, their answers to the questionnaire were often updated as compared to their first progress reports. This probably resulted from a better understanding of the reporting requirements and various technical terms and concepts. Considering this, and the fact that 29 countries now submitted their progress reports for the first time, it is more meaningful to consider the progress made during the past decade, i.e. since the adoption of the Global Plan of Action by the FAO Conference in 2013, instead of focusing on the progress since 2018.

75. Targets A.1, A.2, A.3, A.4 and B.4 consist of a total of 15 action points (see Questions 1–10 and Questions 27–31 in *Appendix I*) for each country to respond to the Global Plan of Action. At the global level, 65 percent of these action points have been achieved or put in place in the 73 reporting countries, and a further 13 percent of the actions have been initiated, but not yet completed, by them. Action points that have not been initiated nor put in place account for 18 percent. For 4 percent of the action points, the reporting countries did not have information available to answer the questions. Only seven of the 73 reporting countries reported having achieved all 15 action points.

76. A total of 28 countries reported achieving one or more action points after the adoption of the Global Plan of Action, and a total of 48 countries reported that efforts have been initiated to achieve one or more action points. These findings demonstrate that specific actions have been taken, as a

⁴² <https://www.bgci.org/resources/bgci-tools-and-resources/red-list-learning-modules/>

⁴³ <https://www.bgci.org/resources/bgci-tools-and-resources/global-seed-conservation-challenge-learning-modules/>

⁴⁴ <https://globaltrees.org/resources/>

⁴⁵ Nyoka B.I. et al., 2015. Tree seed and seedling supply systems: A review of the Asia, Africa and Latin America models. *Small-scale Forestry*, 14:171–191; Lillesø J-P.B. et al., 2018. Why institutional environments for agroforestry seed systems matter. *Development Policy Review* 36: O89-O112; Lillesø J-P.B. et al., 2021. Quality seed for tree planting: Supporting more effective agroforestry and forest landscape restoration by learning from crop Integrated Seed System Development. ICRAF Policy Brief No. 54. Nairobi, Kenya: World Agroforestry (ICRAF).

response to the Global Plan of Action, to enhance the conservation, use and development of FGR at national level. The situation is thus relatively good in many of the reporting countries in terms of having various mechanisms, programmes and strategies on FGR in place. However, most countries still have action points that need to be concluded or initiated.

77. Under Targets B.1, B.2 and B.3 related to the characterization, conservation, use and development of FGR (see Questions 11–26 in *Appendix I*), the number of species reported for this report increased significantly as compared to the First Implementation Report. A total of 2 523 tree and other woody plant species (including hybrids) were reported under these targets by the 73 countries, while in 2018 this figure was 1 145 species. Part of this increase is due to the higher number of reporting countries as many of the 44 countries that reported in 2018 were now able to report more species and also to provide more data for their species.

78. The number of species reported also increased across all species-specific targets and indicators. An up-to-date national distribution range is now available for 2 044 species in the reporting countries, and 1 573 and 731 species have been characterized based on non-molecular and molecular information, respectively. *In situ* and *ex situ* conservation programmes include 1 285 and 987 species, respectively. The reported national tree seed programmes include 700 species to produce forest reproductive material and the reported tree breeding programmes focus on 477 species.

79. These figures cannot be directly compared to the findings of *The State of the World's Forests Genetic Resources* (2014) for which nearly 8 000 tree and other woody plant species were mentioned in the 86 country reports that were submitted for its preparation. The main reason is that the reporting requirements for monitoring the implementation of the Global Plan of Action are more specific as compared to the ones that were used for the preparation of the first global assessment, i.e. rather than reporting if a given species is conserved and/or used, countries were now asked to provide more specific data on their efforts in terms of the number and area of conservation units or seed stands, for example. The first global assessment found that of the nearly 8 000 species mentioned, only around 2 400 were actively managed for products and/or services. It also found that about 1 000 and 1 800 species were included in *in situ* and *ex situ* conservation programmes, respectively. The differences in the reporting requirements and the number of reporting countries make comparisons difficult; however the findings of the present report suggest that the global number of species for which active measures are taken to conserve and/or use their genetic resources has probably remained at the similar level as compared to the situation a decade ago.

80. Although progress has been made in the implementation of the Global Plan of Action, active measures are still limited to selected important tree and other woody plant species that are used for forestry and agroforestry. Based on the comments provided by the NFPs, it is evident that the available human and financial resources available for the FGR work in many countries, and in developing countries in particular, do not allow active measures to be taken for all important and useful species, and even less so for endangered, threatened and rare species.

81. Governments and their agencies continue to be the most important players in FGR conservation and tree breeding. Government organizations are the main stakeholder in all national coordination mechanisms, together with research organizations. Public entities also play the dominant role in tree breeding in nearly all countries with this activity. Extension programmes on FGR use target a diverse group of users which are typically local or community level players but which also include professionals, such forest and nursery managers.

82. A challenge that remains common for both developed and developing countries is the lack, or limited availability, of species-specific data at the national level. This is demonstrated by the fact that several countries, even those with ample human and financial resources available for the FGR work, could only report if species are included in conservation or tree seed programmes but could not provide any data at all on the number and areas of conservation units or seed stands, for example. This raises concerns not only on the effectiveness of FGR conservation in these countries but also on the

availability of even basic information for practitioners and policymakers (e.g. on the production of forest reproductive material for reforestation and restoration).

83. Concerning regional and international cooperation on FGR, the reports submitted by countries, regional networks and international organizations confirmed the important role the networks and the international organizations play in providing technical, and sometimes also financial, support to the management of FGR at the national or subnational levels. Overall, the regional and international cooperation on FGR is very active worldwide but there are several issues that deserve further attention in the future. These include strengthening of the regional collaboration in Africa and the Latin America and the Caribbean, for example, and better disseminating the many tools and knowledge products developed by regional networks and international organizations to different stakeholders in the countries.

84. The next reporting process for continued monitoring of the implementation of the Global Plan of Action offers an opportunity for more countries, regional networks and international organizations to report on their efforts in this regard. The new global information system on FGR, which will be launched in conjunction with the publication of the Second Report, will support gathering of better data on FGR and promoting the use of these data beyond monitoring the implementation of the Global Plan of Action and reporting to the Commission. Moreover, it will complement the many existing regional and international databases on FGR.

85. The preparation of this Second Implementation Report further increased common understanding among countries, regional networks and international organizations, including FAO, on key concepts and technical terms related to the conservation, use and development of FGR. However, there is a need to continue work in this regard so that more and better data and information on FGR can be made available to enhance the management of these resources at national, regional and global levels. This is also necessary to increase awareness on the opportunities for, and challenges in, deploying the full potential of FGR for sustainable development in a changing world.

APPENDIX I

QUESTIONNAIRE FOR SUBMITTING A COUNTRY PROGRESS REPORT

Part A: Responses of countries to the Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources

Target A.1: Availability of data and information on FGR is increased

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| Indicator A.1.1: Extent of national FGR inventories or similar arrangements |
| Verifier A.1.1.1: Number and list of countries with operational national FGR inventories or similar arrangements |
| <p>Question 1: Does your country have an operational national (or subnational) FGR inventory (-ies)?</p> <p><input type="checkbox"/> Yes If yes, please indicate the year when it was established: _____</p> <p>If yes, please indicate the areas of work/activities documented by the national FGR inventory:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Conservation of FGR <input type="checkbox"/> Production of forest reproductive material <input type="checkbox"/> Research and development efforts (provenance trials, tree breeding etc) <input type="checkbox"/> FGR transferred internationally <input type="checkbox"/> Other (please specify under Comments) <p><input type="checkbox"/> No, but a process for establishing a national FGR inventory has been initiated</p> <p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Information not available</p> |
| Comments / additional information: |
| <p>Notes for reporting: This verifier focuses on the existence of a national FGR inventory as a mechanism or process, not on the completeness of the inventory. If the exact establishment year is not known, or if the national FGR inventory was developed over many years, the establishment year can be estimated based on the available information. The establishment of a national FGR inventory can be reported as “initiated” if a project or other action for this purpose has been approved or is being implemented.</p> |

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| Indicator A.1.2: Extent of up-to-date national FGR information systems |
| Verifier A.1.2.1: Number and list of countries with up-to-date national FGR information system(s) or other similar arrangements |
| <p>Question 2: Does your country have an up-to-date national (or subnational) FGR information system(s)?</p> <p><input type="checkbox"/> Yes If yes, please indicate the year when it (or the first one) was established: _____</p> <p>If yes, please indicate the areas of work/activities recorded in the information system(s):</p> <ul style="list-style-type: none"> <input type="checkbox"/> Conservation of FGR <input type="checkbox"/> Production of forest reproductive material <input type="checkbox"/> Research and development efforts (provenance trials, tree breeding etc) <input type="checkbox"/> FGR transferred internationally <input type="checkbox"/> Other (please specify under Comments) <p><input type="checkbox"/> No, but a process for establishing a national FGR information system has been initiated</p> <p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Information not available</p> |
| Comments / additional information: |
| Notes for reporting: The establishment of a national FGR information system can be reported as “initiated” if a project or other action for this purpose has been approved or is being implemented. |

Target A.2: National *in situ* and *ex situ* systems for FGR conservation are strengthened

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| Indicator A.2.1: Extent of national <i>in situ</i> conservation systems |
| Verifier A.2.1.1: Number and list of countries with operational national <i>in situ</i> conservation systems |
| <p>Question 3: Does your country have an operational national (or subnational) <i>in situ</i> conservation system(s) for FGR?</p> <p><input type="checkbox"/> Yes If yes, please indicate the year when it was established: _____</p> <p>If yes, please indicate different components of the conservation system:</p> <ul style="list-style-type: none"> <input type="checkbox"/> <i>In situ</i> conservation units of FGR <input type="checkbox"/> Protected areas <input type="checkbox"/> Forests managed for production of wood and/or non-wood products <input type="checkbox"/> Other (please specific under Comments) <p><input type="checkbox"/> No, but a process for establishing a national <i>in situ</i> conservation system has been initiated</p> <p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Information not available</p> |

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| Comments / additional information: |
| Notes for reporting: This verifier focuses on the existence of a national <i>in situ</i> conservation system (or programme) for FGR, not on the completeness of the conservation network. |

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| Indicator A.2.2: Extent of national <i>ex situ</i> conservation systems |
| Verifier A.2.2.1: Number and list of countries with operational national <i>ex situ</i> conservation systems |
| <p>Question 4: Does your country have an operational national (or subnational) <i>ex situ</i> conservation system(s) for FGR?</p> <p><input type="checkbox"/> Yes If yes, please indicate the year when it was established: _____</p> <p>If yes, please indicate different components of the conservation system:</p> <p><input type="checkbox"/> <i>Ex situ</i> conservation stands <input type="checkbox"/> Field collections <input type="checkbox"/> Storage facilities for seed, pollen or other tissue <input type="checkbox"/> Other (please specific under Comments)</p> <p><input type="checkbox"/> No, but a process for establishing a national <i>ex situ</i> conservation system has been initiated <input type="checkbox"/> No <input type="checkbox"/> Information not available</p> |
| Comments / additional information: |
| Notes for reporting: This verifier focuses on the existence of a national <i>ex situ</i> conservation system (or programme) for FGR, not on the amount of FGR conserved <i>ex situ</i> . |

Target A.3: Tree seed and breeding programmes, as well as extension efforts on FGR use, are reinforced, including for conservation collections

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| Indicator A.3.1: Extent of national tree seed programmes |
| Verifier A.3.1.1: Number and list of countries with operational national tree seed programmes or similar arrangements |
| <p>Question 5: Does your country have an operational national (or subnational) tree seed programme(s)?</p> <p><input type="checkbox"/> Yes If yes, please indicate the year when it was established: _____</p> <p><input type="checkbox"/> No, but a process for establishing an operational national tree seed programme has been initiated <input type="checkbox"/> No</p> |

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| <input type="checkbox"/> Information not available |
| Comments / additional information: |
| Notes for reporting: The establishment of a national tree seed programme can be reported as “initiated” if a project or other action for this purpose has been approved or is being implemented. |

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| Indicator A.3.2: Extent of tree breeding programmes |
| Verifier A.3.2.1: Number and list of countries with operational tree breeding programmes |
| <p>Question 6: Do public entities, private companies and/or other stakeholders operate a tree breeding programme (or programmes) in your country?</p> <p><input type="checkbox"/> Yes If yes, please indicate the main stakeholder group operating tree breeding programme(s)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Public entities <input type="checkbox"/> Private companies <input type="checkbox"/> Private–public partnerships <input type="checkbox"/> Other stakeholders (please specify under Comments) <p><input type="checkbox"/> No, but a process for establishing a tree breeding programme (or programmes) has been initiated</p> <p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Information not available</p> |
| Comments / additional information: |
| Notes for reporting: If “Other stakeholders” are the main group operating tree breeding programme(s), please identify them under the Comments section. The establishment of a tree breeding programme can be reported as “initiated” if a project or other action for this purpose has been approved or is being implemented. |

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| Indicator A.3.3: Extent of extension efforts promoting appropriate use of FGR |
| Verifier A.3.3.1: Number and list of countries with ongoing extension programmes or activities on FGR use |
| <p>Question 7: Does your country have an extension programme (or programmes) that organizes extension activities on FGR use on a regular basis?</p> <p><input type="checkbox"/> Yes If yes, please indicate the year when it (or the first such programme) was established: _____</p> <p>If yes, please indicate the targeted FGR users of the extension programme:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Farmers <input type="checkbox"/> Local communities <input type="checkbox"/> Forest owners |

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| <input type="checkbox"/> Others (please specify under Comments) <input type="checkbox"/> No, but a process for establishing an extension programme (or programmes) on FGR use has been initiated <input type="checkbox"/> No <input type="checkbox"/> Information not available |
| Comments / additional information: |
| Notes for reporting: The establishment of an extension programme can be reported as “initiated” if a project or other action for this purpose has been approved or is being implemented. |

Target A.4: National coordination mechanisms on FGR are created, and national strategies for FGR conservation and use are developed and implemented

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| Indicator A.4.1: Extent of national coordination mechanisms on FGR |
| Verifier A.4.1.1: Number and list of countries with national coordination mechanisms on FGR |
| <p>Question 8: Does your country have a national (or sub-national) coordination mechanism(s) on FGR?</p> <input type="checkbox"/> Yes If yes, please indicate the year when it was established: _____ If yes, please indicate the stakeholders involved in the national FGR coordination mechanism: <ul style="list-style-type: none"> <input type="checkbox"/> Farmers <input type="checkbox"/> Forest owners <input type="checkbox"/> Private sector <input type="checkbox"/> Non-governmental organizations <input type="checkbox"/> Governmental organizations (including state-owned enterprises) <input type="checkbox"/> Research organizations (including universities) <input type="checkbox"/> Relevant ministries <input type="checkbox"/> Others (please specify under Comments) <input type="checkbox"/> No, but a process for establishing a national coordination mechanism on FGR has been initiated <input type="checkbox"/> No <input type="checkbox"/> Information not available |
| Comments / additional information: |
| Notes for reporting: The establishment of a national coordination mechanism on FGR can be reported as “initiated” if a project or other action for this purpose has been approved or is being implemented. |

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| Indicator A.4.2: Extent of national strategies for FGR conservation and use |
| Verifier A.4.2.1: Number and list of countries implementing national strategies for FGR conservation and use |
| <p>Question 9: Does your country have a national strategy (or subnational strategies) for FGR conservation and use?</p> <p><input type="checkbox"/> Yes If yes, please indicate the year when it (or the first such strategy) was prepared: _____</p> <p>If yes, please indicate the areas of work covered by the strategy:</p> <p><input type="checkbox"/> Conservation of FGR <input type="checkbox"/> Use of FGR <input type="checkbox"/> Development of FGR</p> <p><input type="checkbox"/> No, but a process for preparing a national strategy for FGR conservation and use has been initiated</p> <p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Information not available</p> |
| Comments / additional information: |
| <p>Notes for reporting: The process for preparing a national strategy for FGR can be reported as “initiated” if a project or other action for this purpose has been approved or is being implemented. If the preparation of the national strategy has been initiated, please indicate under Comments if the strategy will cover all areas of work (i.e. conservation, use and development of FGR) or only some of them.</p> |

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| Indicator A.4.3: Extent to which national strategies contribute to the implementation of regional or sub-regional FGR conservation strategies |
| Verifier A.4.3.1: Number and list of countries whose national strategy contributes to the implementation of regional or sub-regional FGR conservation strategy |
| <p>Question 10: If your country has a national strategy for FGR, is it aligned with a regional or sub-regional FGR conservation strategy (-ies)?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No, but a process for aligning the national FGR strategy with a regional conservation strategy has been initiated</p> <p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Information not available</p> |
| Comments / additional information: |
| <p>Notes for reporting: If no regional or sub-regional FGR conservation strategy exist, please indicate this under Comments. The process for aligning the national FGR strategy with a regional conservation strategy can be reported as “initiated” if a project or other action for this purpose has been approved or is being implemented.</p> |

Part B: State of conservation, use and development of forest genetic resources

Target B.1: Forest genetic resources are regularly assessed and characterized

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| Indicator B.1.1: Assessment of FGR |
| Verifier B.1.1.1: Number and list of species for which an up-to-date national distribution range is available |
| Question 11: Please indicate those species for which an up-to-date national distribution range is available: <input type="checkbox"/> To be indicated from the list of species incorporated in the online questionnaire |
| Comments / additional information: |
| Notes for reporting: A distribution map can be considered as up-to-date if less than 10 years have passed since the national distribution area of a species was assessed or re-documented. |

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| Indicator B.1.2: Characterization of FGR |
| Verifier B.1.2.1: Number and list of species that have been characterized based on non-molecular information (e.g. provenance trials, ecological or climatic zonation) |
| Question 12: Please indicate those species that have been characterized based on non-molecular information: <input type="checkbox"/> To be indicated from the list of species incorporated in the online questionnaire |
| Comments / additional information: |
| Notes for reporting: A species can be reported here when a large part of its genetic resources have been evaluated; it is not necessary that all populations or provenances of a species within a country have been characterized. Species for which characterization efforts have been started only recently can also be reported here. |
| Verifier B.1.2.2: Number and list of species that have been characterized based on molecular information (e.g. range-wide sampling of populations for molecular marker studies) |
| Question 13: Please indicate those species that have been characterized based on molecular information: <input type="checkbox"/> To be indicated from the list of species incorporated in the online questionnaire |
| Comments / additional information: |
| Notes for reporting: A species can be reported here when a large part of its genetic resources has been evaluated; it is not necessary that all populations or provenances of a species within a country have been characterized. Species for which characterization efforts have been started only recently can also be reported here. |

Target B.2: Forest genetic resources are conserved *in situ*, and complementary *ex situ* measures have been implemented

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| Indicator B.2.1: Amount of FGR conserved <i>in situ</i> |
| Verifier B.2.1.1: Number and list of species included in <i>in situ</i> conservation programmes |
| Question 14: Please indicate those species that have been included in <i>in situ</i> conservation programme(s) in your country: <input type="checkbox"/> To be indicated from the list of species incorporated in the online questionnaire |
| Comments / additional information: |
| Notes for reporting: |
| Verifier B.2.1.2: Number of <i>in situ</i> conservation units by species |
| Question 15: Please indicate the number of <i>in situ</i> conservation units for each of the species in your country: <input type="checkbox"/> To be added to the online table listing all selected species |
| Comments / additional information: |
| Notes for reporting: If the information on the units is not available, “n/a” should be indicated in the table. |
| Verifier B.2.1.3: Area (ha) designated and managed for <i>in situ</i> conservation by species |
| Question 16: Please indicate the area (in hectares) of <i>in situ</i> conservation units for each of the species in your country: <input type="checkbox"/> To be added to the online table listing all selected species |
| Comments / additional information: |
| Notes for reporting: The area by species should be indicated in hectares and with an accuracy of one decimal, e.g. 50.4 ha. In case the information on the units is not available, “n/a” should be indicated in the table. |

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| Indicator B.2.2: Amount of FGR conserved <i>ex situ</i> |
| Verifier B.2.2.1: Number and list of species included in <i>ex situ</i> conservation programmes |
| Question 17: Please indicate those species that have been included in <i>ex situ</i> conservation programme(s) in your country: <input type="checkbox"/> To be indicated from the list of species incorporated in the online questionnaire |

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| Comments / additional information: |
| Notes for reporting: |
| Verifier B.2.2.2: Number of <i>ex situ</i> conservation units by species |
| Question 18: Please indicate the number of <i>ex situ</i> conservation units for each of the species in your country: <input type="checkbox"/> To be added to the online table listing all selected species |
| Comments / additional information: |
| Notes for reporting: If the information on the units is not available, “n/a” should be indicated in the table. |
| Verifier B.2.2.3: Area (ha) designated and managed for <i>ex situ</i> conservation by species |
| Question 19: Please indicate the area (in hectares) of <i>ex situ</i> conservation units for each of the species in your country: <input type="checkbox"/> To be added to the online table listing all selected species |
| Comments / additional information: |
| Notes for reporting: The area by species should be indicated in hectares and with an accuracy of one decimal, e.g. 50.4 ha. If the information on the units is not available, “n/a” should be indicated in the table. |
| Verifier B.2.2.4: Number of <i>ex situ</i> accessions (in seed and clone banks) by species |
| Question 20: Please indicate the number of <i>ex situ</i> accessions for each of the species in your country: <input type="checkbox"/> To be added to the online table listing all selected species |
| Comments / additional information: |
| Notes for reporting: In case the information on the accessions is not available, “n/a” should be indicated in the table. |

Target B.3: Use and development of FGR are enhanced

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| Indicator B.3.1: Species included in tree seed and breeding programmes (including international breeding cooperation and efforts carried out by the private sector) |
| Verifier B.3.1.1: Number and list of species included in national tree seed programmes |

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| <p>Question 21: Please indicate those species that have been included in a national (or sub-national) tree seed programme(s) in your country:</p> <p><input type="checkbox"/> To be indicated from the list of species incorporated in the online questionnaire</p> |
| Comments / additional information: |
| Notes for reporting: |
| Verifier B.3.1.2: Number and list of species included in tree breeding programmes |
| <p>Question 22: Please indicate those species that have been included in a tree breeding programme in your country:</p> <p><input type="checkbox"/> To be indicated from the list of species incorporated in the online questionnaire</p> |
| Comments / additional information: |
| Notes for reporting: |

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| Indicator B.3.2: Production of forest reproductive material |
| Verifier B.3.2.1: Area (ha) and number of seed stands by species |
| <p>Question 23: Please indicate the area and number of seed stands by species in your country:</p> <p><input type="checkbox"/> To be added to the online table listing all selected species</p> |
| Comments / additional information: |
| Notes for reporting: The area of seed stands by species should be indicated in hectares and with an accuracy of one decimal, e.g. 176.3 ha. If the information on the seed stands is not available, “n/a” should be indicated in the table. |
| Verifier B.3.2.2: Area (ha) and number of seed orchards by species |
| <p>Question 24: Please indicate the area and number of seed orchards by species in your country:</p> <p><input type="checkbox"/> To be added to the online table listing all selected species</p> |
| Comments / additional information: |
| Notes for reporting: The area of seed orchards by species should be indicated in hectares and with an accuracy of one decimal, e.g. 35.6 ha. If the information on the seed orchards is not available, “n/a” should be indicated in the table. |
| Verifier B.3.2.3: Amount (average number per year) of planting stock produced through macro and micropropagation by species |

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| <p>Question 25: Please indicate the amount (average number per year) of planting stock produced through macro and/or micropropagation by species in your country:</p> <p><input type="checkbox"/> To be added to the online table listing all selected species</p> |
| <p>Comments / additional information:</p> |
| <p>Notes for reporting: If the information on the planting stock produced is not available, “n/a” should be indicated in the table.</p> |

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| <p>Indicator B.3.3: State of tree breeding programmes</p> |
| <p>Verifier B.3.3.1: Testing and selection cycle by species</p> |
| <p>Question 26: Please indicate the state of a tree breeding programme by indicating the generation number for species included in breeding programmes:</p> <p><input type="checkbox"/> To be added to the online table listing all selected species</p> |
| <p>Comments / additional information:</p> |
| <p>Notes for reporting: The generation number should be indicated as 1, 1.5, 2, etc. It should refer to the material that has already been deployed for the establishment of seed orchards or mass propagation using vegetative techniques, not to the material that is still under breeding and/or testing. If the information is not available, “n/a” should be indicated in the table.</p> |

Target B.4: Policies and capacities supporting FGR conservation and sustainable use are strengthened

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| <p>Indicator B.4.1: Integration of FGR conservation and use into relevant national policies</p> |
| <p>Verifier B.4.1.1: Number of countries that have integrated FGR conservation and use into their national forest programme and/or national forest policy</p> |
| <p>Question 27: Have FGR conservation and use been integrated into a national (or subnational) forest programme(s) and/or national (or sub-national) forest policy (-ies) in your country?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No, but a process for integrating FGR conservation and use into a national forest programme and/or national forest policy has been initiated</p> <p><input type="checkbox"/> No, because my country does not have a national forest programme and/or national forest policy</p> <p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Information not available</p> |
| <p>Comments / additional information:</p> |

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| Notes for reporting: |
| Verifier B.4.1.2: Number of countries that have integrated FGR conservation and use into their national biodiversity action plans and/or related policies |
| <p>Question 28: Have FGR conservation and use been integrated into a national (or subnational) biodiversity action plan(s) and related polices in your country?</p> <ul style="list-style-type: none"> <input type="checkbox"/> Yes <input type="checkbox"/> No, but a process for integrating FGR conservation and use into a national biodiversity action plan has been initiated <input type="checkbox"/> No, because my country does not have a national biodiversity action plan <input type="checkbox"/> No <input type="checkbox"/> Information not available |
| Comments / additional information: |
| Notes for reporting: |
| Verifier B.4.1.3: Number of countries which have integrated FGR conservation and use into their national adaptation strategies for climate change |
| <p>Question 29: Have FGR conservation and use been integrated into a national (or subnational) adaptation strategy (-ies) for climate change in your country?</p> <ul style="list-style-type: none"> <input type="checkbox"/> Yes <input type="checkbox"/> No, but a process for integrating FGR conservation and use into a national adaptation strategy for climate change has been initiated <input type="checkbox"/> No, because my country does not have a national adaptation strategy for climate change <input type="checkbox"/> No <input type="checkbox"/> Information not available |
| Comments / additional information: |
| Notes for reporting: |

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| Indicator B.4.2: Participation in regional/sub-regional collaboration on FGR |
| Verifier B.4.2.1: Number of countries participating in regional/subregional networks on FGR |
| <p>Question 30: Is your country a member of a regional and/or subregional network(s) on FGR?</p> <ul style="list-style-type: none"> <input type="checkbox"/> Yes If yes, please indicate in which networks(s): _____ <input type="checkbox"/> No, but my country is considering joining a regional and/or subregional network(s) <input type="checkbox"/> No <input type="checkbox"/> Information not available |

Comments / additional information:

Notes for reporting:

Indicator B.4.3: Participation in international research and development cooperation on FGR

Verifier B.4.3.1: Number of countries and national organizations participating in international R&D cooperation on FGR

Question 31: Is your country participating in international R&D collaboration on FGR?

- Yes
If yes, please indicate the number of national organizations currently participating: ____
- No, but my country and its national organizations have sought opportunities for participating in international R&D cooperation on FGR
- No, my country and its national organizations are currently not participating in international R&D cooperation on FGR but have done so during the past five years
- No
- Information not available

Comments / additional information:

Notes for reporting: The names of the national organizations (including government and non-governmental organizations, universities and other relevant organizations) can be provided under Comments.

APPENDIX II

GLOSSARY OF TECHNICAL TERMS

Characterization based on non-molecular information refers to the description and evaluation of forest genetic resources (FGR) based on information obtained from field observations, provenance trials or ecological/climatic zonation of species' distribution range within a country, for example. The characterization of FGR is typically done at the level of populations or provenances. In general, genetic resources are characterized based on traits that are usually heritable, easy to observe by the eye and expressed across different environments.

Characterization based on molecular information refers to the description and evaluation of FGR based on information obtained through molecular markers and/or genomic approaches.

Designated means that an area has been assigned to *in situ* and/or *ex situ* conservation of FGR by law or other arrangement, depending on how a country (or state) has organized its work on FGR.

***Ex situ* accession** refers to a sample of FGR stored in a seed bank or a genotype held in a clonal collection.

***Ex situ* conservation of FGR** refers to the conservation of genetic resources of trees and other woody plant species outside their natural habitats.

***Ex situ* conservation unit** refers to a range of *ex situ* genetic conservation areas of forest trees and other woody plants species (e.g. *ex situ* conservation stands, provenance and progeny trials, and breeding populations).

Extension programmes or activities refers to training and communication efforts targeted to users of FGR (farmers, local communities, forest owners, etc.) with an aim to help them enhance their use of FGR to derive economic and other benefits. Extension activities may include short-term training courses and workshops, field trips, exhibitions, media campaigns and dissemination of information through leaflets, posters and guidelines, or even development of online tools.

Forest genetic resources (FGR) refers to the heritable materials maintained within and among tree and other woody plant species that are of actual or potential economic, environmental, scientific or societal value.

Forest reproductive material refers to any plant tissue that is created by sexual or asexual means (e.g. seeds, pollen and cuttings) and used for the production of new trees or other woody species.

***In situ* conservation of FGR** refers to the maintenance of viable populations of trees and other woody plant species in their natural surroundings.

***In situ* conservation unit** refers to a range of *in situ* genetic conservation areas of forest trees and other woody plants species (e.g. gene reserve forests, genetic conservation units or stands, gene management units or zones, and evolutionary conservation units or stands).

International research and development cooperation refers to global, regional and subregional research projects (or project proposals), tree breeding programmes and other research and development efforts.

Macropropagation refers to vegetative propagation of planting stock from cuttings, grafting or air-layering.

Micropropagation refers to vegetative propagation of planting stock by *in vitro* technology producing plantlets, micropropagules or somatic embryos.

National adaptation strategy for climate change refers to a national adaptation strategy, action plan and/or programme(s) for climate change.

National biodiversity action plan refers to a national strategy, action plan and/or programme(s) for the conservation and sustainable use of biological diversity.

National distribution range of a species refers to area(s) within a country where a species is growing naturally, and where it might have been introduced.

National forest programme refers to a wide range of approaches that are used to develop and/or revise forest policy and related strategy (or strategies) at the national or subnational levels, and to facilitate their implementation.

National forest policy is typically a government document that presents a vision or goals on forests (and trees) and their use shared by government and other stakeholders.

National (or subnational) coordination mechanism on FGR refers to a range of approaches that are used to coordinate the work on FGR at national or subnational levels. Various stakeholders (e.g. farmers, forest owners, the private sector, non-governmental organizations, research organizations and relevant ministries) are typically represented in such a national coordination mechanism. Examples of national coordination mechanisms include national (or subnational) FGR programmes and national (or subnational) committees or working groups on FGR.

National (or subnational) *ex situ* conservation programme (or system) for FGR refers to an *ex situ* conservation programme of FGR that is undertaken and coordinated by a designated national (or subnational) agency working in collaboration with various stakeholders. An *ex situ* conservation programme is often based on a combination of *ex situ* conservation stands, field collections (e.g. clonal archives and stool beds) and storage facilities for seed, pollen or other tissue.

National (or subnational) FGR information system refers to a database (or databases) and other electronic documentation systems (offline or online) that is used by a national FGR inventory to gather, store and/or make available the data and information on FGR. A national FGR information system is up-to-date when the data and information are updated periodically (e.g. annually) or whenever new data and information have become available.

National (or subnational) FGR inventory (-ies) refers to a mechanism that gathers data and information, often from several data-providers within a country, on areas and facilities managed for the conservation of FGR and the production of forest reproductive material, as well as related research and development (R&D) efforts, for example. A national (or subnational) FGR inventory is operational when the collection of data and information is repeated frequently, and when the data and information are processed, stored and made available to support policymaking, management of FGR and R&D efforts.

National (or subnational) *in situ* conservation programme (or system) for FGR refers to a long-term *in situ* conservation programme of FGR that is undertaken and coordinated by a designated national (or subnational) agency working in collaboration with various stakeholders. Typically, the main aim of such a conservation programme is to establish and maintain a network of *in situ* conservation units for FGR in a country (or state).

National (or subnational) strategy (-ies) for FGR conservation and use presents the country's (or its states') vision and goals for the conservation and use of FGR, and describes how it intends to achieve these goals. A national (or subnational) strategy for FGR conservation and use typically reflects both binding (e.g. the Convention on Biological Diversity) and non-binding (e.g. the Global

Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources) international commitments made by the country.

National (or subnational) tree seed programme refers to a mechanism (or mechanisms) that oversees and/or coordinates the selection, procurement, documentation, storage and testing of forest reproductive material at national or subnational levels. Such a mechanism typically brings together an official body responsible for approving basic material and maintaining a national or subnational register of this material, as well as other stakeholders (public and private) involved in the selection, procurement, storage and testing of forest productive material.

Operational means that a programme and/or activities are being implemented, and that relevant stakeholders provide inputs and/or meet regularly.

Regional or subregional FGR conservation strategy refers to a vision and goals for the conservation of FGR that a group of countries may have agreed in the context of regional or subregional networks or other collaboration platforms on FGR.

Regional or subregional network on FGR refers to a regional or subregional network, programme or working group that promote international collaboration on forest genetic resources.

Seed stand refers to a delineated population of trees or other woody plant species that is identified and registered by a relevant national (or subnational) authority for producing forest reproductive material.

Seed orchards refers to a plantation of selected individuals of trees or other woody plant species (identified by clone, family or provenance) that is specifically managed for seed production.

Tree breeding programme refers to systematic efforts based on the application of genetic principles and practices to develop improved trees. Tree breeding programmes may be public, private or private–public partnerships, and they may operate at subnational, national, regional or global scales.

APPENDIX III**RECOMMENDED STRUCTURE AND CONTENT OF REPORTS BY REGIONAL NETWORKS AND INTERNATIONAL ORGANIZATIONS****CONTRIBUTIONS OF _____ TO THE IMPLEMENTATION OF THE GLOBAL PLAN OF ACTION FOR THE CONSERVATION, SUSTAINABLE USE AND DEVELOPMENT OF FOREST GENETIC RESOURCES****2018 – 2022**

[Name, position and email address of the contact person and possible alternates]

Introduction

[Brief description of a regional network or an international organization, and its mission and objectives as they relate to forest genetic resources (FGR). Other background information can also be provided, as appropriate]

Priority Area 1: Improving the availability of, and access to, information on forest genetic resources

[Description of contributions to the strategic priorities of this Priority Area, with special emphasis on possible activities on FGR inventories, FGR information systems, species distribution maps, characterization of FGR based on non-molecular and molecular information, FGR research, and dissemination of information on FGR]

Priority area 2: Conservation of forest genetic resources (*in situ* and *ex situ*)

[Description of contributions to the strategic priorities of this Priority Area, with special emphasis on possible activities on supporting *in situ* and *ex situ* conservation of FGR, development of regional conservation strategies, and promotion of regional/international cooperation in this area]

Priority area 3: Sustainable use, development and management of forest genetic resources

[Description of contributions to the strategic priorities of this Priority Area, with special emphasis on possible activities on forest reproductive material, germplasm exchange, tree breeding, biotechnology, and promotion of regional/international cooperation in this area]

Priority area 4: Policies, institutions and capacity-building

[Description of contributions to the strategic priorities of this Priority Area, with special emphasis on possible activities on supporting development of policies, strengthening of institutions, capacity

building, mobilizations of resources, including funding, for FGR conservation and use, promotion of regional/international cooperation in this area]

Concluding remarks

[Description of any other contributions or provision of additional information, as well as description of plans of the regional network or international organization for contributing to the implementation of the Global Plan of Action in the future]

Annex

[List of relevant publications, reports, tools, databases and other knowledge products produced and/or maintained by a regional network or an international organization]