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DRAFT VOLUNTARY GUIDELINES FOR PREPARING A NATIONAL STRATEGY FOR FOREST GENETIC RESOURCES

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I. INTRODUCTION

1. At its last session, the Commission on Genetic Resources for Food and Agriculture (the Commission) requested FAO to prepare draft voluntary guidelines for preparing a national strategy for forest genetic resources in line with the proposed outline¹ and taking into account existing guidelines for the preparation of national forest programmes and for the formulation of forest policy to avoid duplication of work.² In preparing the draft guidelines, FAO also considered the guidance provided by the Intergovernmental Technical Working Group on Forest Genetic Resources (the Working Group) at its last session.
2. The *Appendix* to this document presents the draft guidelines for preparing a national strategy for forest genetic resources, for review by the Working Group.

II. BACKGROUND

3. The draft guidelines aim to support countries in implementing the *Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources* (Global Plan of Action)³ and to promote the integration of forest genetic resources into other relevant national instruments and strategies. A national strategy for forest genetic resources (national FGR strategy) is a roadmap and an action plan for the conservation, sustainable use and development of forest genetic resources at the national (or sub-national) level. It should be based on the national status of forest genetic resources and their current level of management, and define targets for the conservation, sustainable use and development of these resources. The national FGR strategy and its implementation should be considered as a continuous process, including monitoring of progress against the targets and revision of the strategy (e.g. every 10 years), as needed. In addition to the targets, the national FGR strategy should identify priorities for improving the management of forest genetic resources and related actions, as well as clarify responsibilities and mobilize resources for its implementation. The draft guidelines explain steps that may be followed while preparing the national FGR strategy and options for integrating the national FGR strategy with other relevant national strategies.

¹ CGRFA-16/17/19, *Appendix A*.

² CGRFA-16/17/Report, paragraph 73.

³ <http://www.fao.org/3/a-i3849e.pdf>

APPENDIX

DRAFT VOLUNTARY GUIDELINES FOR PREPARING A NATIONAL STRATEGY FOR FOREST GENETIC RESOURCES**Preface****Executive summary****List of acronyms****INTRODUCTION****Forest genetic resources**

Forest genetic resources (FGR) refer 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 (FAO 2014a). Forest trees and other woody plant species provide wood, fibre, fuel and many non-wood forest products. They also contribute to a broad range of ecosystem services and fulfil environmental functions. There are approximately 60,000 tree species in the world (Beech et al. 2017) but only few of them have been studied in any depth for their present and future potential. Globally, around 2,400 species of trees, shrubs, palms and bamboos are actively managed for products and/or services, and approximately 700 tree species are subject to tree improvement programmes (FAO 2014a).

Forests cover nearly 4 billion hectares and the area of other wooded lands accounts additional 1.2 billion (FAO 2016a). A large number of people rely on forests and trees outside of forests to meet their needs for food, energy and shelter. It is estimated that about 2.4 billion people cook with woodfuel, and that 764 million of these people also boil their water with wood (FAO 2016b). Forest products also make a significant contribution to the shelter of at least 1.3 billion people (FAO 2016b). Furthermore, the collection of edible non-wood forest products supports food security and provides essential nutrients for many people. Forests and trees outside of forest are thus important for sustainable development.

In 2017, the United Nations (UN) General Assembly adopted the UN Strategic Plan for Forests 2017-2030 which provides a global framework for actions at all levels to sustainably manage all types of forests and trees outside forests, and to halt deforestation and forest degradation. The strategic plan includes six global forest goals and 26 associated targets to be achieved by 2030. These voluntary goals and targets contribute to the implementation of the 2030 Agenda for Sustainable Development and the Paris Agreement of the UN Framework Convention on Climate Change (UNFCCC), as well as the Convention on Biological Diversity (CBD) and the United Nations Convention to Combat Desertification (UNCCD). Global Forest Goal 2 (*Enhance forest-based economic, social and environmental benefits, including by improving the livelihoods of forest-dependent people*) includes the conservation and sustainable use of genetic diversity of forests and trees outside of forests as one of the indicative thematic areas for action. Furthermore, sustainable and appropriate use of FGR is crucial for achieving Global Forest Goal 1 (*Reverse the loss of forest cover worldwide through sustainable forest management, including protection, restoration, afforestation and reforestation, and increase efforts to prevent forest degradation and contribute to the global effort of addressing climate change*).

Genetic diversity ensures that trees and other woody plant species can survive, adapt and evolve under changing environmental conditions. Genetic diversity is also needed for maintaining the vitality of forests and provide resilience to pests and diseases. Furthermore, genetic diversity is the foundation of biological diversity at species and ecosystem levels. Forests are home to the vast majority of the Earth's

terrestrial biodiversity and trees are the keystone species of forest ecosystems. Therefore, forest genetic resources are a corner stone of sustainable forest management (see Box 1).

Box 1. The concept of sustainable forest management

In Resolution 62/98 (2007), the UN General Assembly recognized that forests and trees outside forests provide multiple economic, social and environmental benefits, and emphasized that sustainable forest management contributes significantly to sustainable development and poverty eradication. It further recognized sustainable forest management as a dynamic and evolving concept that is intended to maintain and enhance the economic, social and environmental value of all types of forests, for the benefit of present and future generations. The seven elements of sustainable forest management are 1) extent of forest resources, 2) forest biological diversity, 3) forest health and vitality, 4) productive functions of forest resources, 5) protective functions of forest resources, 6) socio-economic functions of forests, and 7) legal, policy and institutional framework.

Global Plan of Action for the Conservation, Sustainable Use and Development of FGR

The FAO Conference adopted the *Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources* (GPA-FGR) in June 2013. It was developed based on the findings of the first-ever *State of the World's Forest Genetic Resources* (SoW-FGR-1) (FAO 2014a). Both the GPA-FGR and the SoW-FGR-1 were prepared on the request of the Commission on Genetic Resources for Food and Agriculture (CGRFA) and following recommendations by the Intergovernmental Technical Working Group on Forest Genetic Resources (ITWG-FGR). In June 2014, the FAO Committee on Forestry (COFO) also welcomed the SoW-FGR and the GPA-FGR, and acknowledged the importance of FAO's work in this area.

The GPA-FGR identifies a total of 27 strategic priorities for action for the conservation, sustainable use and development of FGR (FAO 2014b). Each strategic priority is assigned to international, regional or national level, depending on what level the proposed action should take place. Furthermore, the strategic priorities are grouped into the following four priority areas:

1. Improving the availability of, and access to, information on FGR;
2. Conservation of FGR (*in situ* and *ex situ*);
3. Sustainable use, development and management of FGR; and
4. Policies, institutions and capacity-building.

The GPA-FGR is voluntary and non-binding, and it should be implemented in line with national legislation and international agreements, where applicable. It is a rolling document that can be updated by the CGRFA. The relative priority of the strategic priorities and associated actions may differ significantly across different countries and regions. They are based on the assumption that countries have sovereign rights over their natural resources and that international cooperation is necessary for effective management of FGR.

Several strategic priorities of the GPA-FGR refer to national strategies on FGR. Strategic Priority 18 calls for development of national strategies for *in situ* and *ex situ* conservation of FGR and their sustainable use. Furthermore, Strategic Priority 19 urges countries to update FGR conservation and management needs and integrate them into wider policies, programmes and frameworks of action at national, regional and global levels. Strategic Priority 20 encourages collaboration and coordination among national institutes and programmes related to FGR.

Targets and indicators for forest genetic resources

Targets (also called criteria or objectives) and indicators, together with goals and verifiers, have long been used for conceptualizing and evaluating the management of natural resources, including forest genetic resources (Boyle 2000). They are interlinked and have the following hierarchy:

- Goals provide the overall justification for targets, indicators and verifiers.
- Targets make goals more meaningful and operational without being themselves direct measures for implementation.
- Indicators are based on components of natural or man-made systems that can be attributed to, or used as a proxy for, the sustainability or other aspects of these systems and their utilisation.
- Verifiers are data or information that provide means of verification. Each indicator needs one or more verifiers.

Targets and indicators for forest genetic resources have been developed and tested for over 20 years. The purpose of various indicator schemes have ranged from monitoring of genetic diversity within tree populations at the forest management unit level (e.g. Namkoong et al. 2002) to assessing the status and trends of forest genetic resources at the global level (e.g. Graudal et al. 2014). Indicators are usually developed within a conceptual framework that is based on state, pressure, benefit and response indicators (UNEP/CBD/AHTEG 2011).

In February 2017, the CGRFA adopted targets, indicators and verifiers for forest genetic resources to be used as assessment tools for monitoring the implementation of the GPA-FGR (see Annex 1). The targets for forest genetic resources specify objectives for countries to achieve in response to the GPA-FGR and track the extent to which countries have met the objectives. The indicators measure the progress countries make against the objectives.

The targets and indicators consist of two sets. The first set of indicators tracks the policy responses of countries to the GPA-FGR, and the second one focus on the state of conservation, use and development of FGR. The targets and indicators were formulated based on the broader needs and actions identified at the level of priority areas in the GPA-FGR.

Why is a national FGR strategy needed?

In the forest sector, it has long been recognized that a sectoral policy should contribute to the achievement of development goals of the whole society and that such policy should not only focus on outlining the principles and objectives for the management of forest resources. Subsequently, the development and implementation of forest policy in many countries have been based on a holistic and cross-sectoral approach, and also acknowledged the importance of conserving forest genetic resources (FAO 1987).

Since the UN Conference on Environment and Development, held in 1992, global and regional forest policy dialogues have made considerable progress in developing and promoting sustainable forest management. These efforts also produced a strategic concept, i.e. “national forest programmes” (NFPs) which covers a wide range of approaches used for forest policy formulation, planning and implementation at the national (or subnational) level. This concept involves a continuous communication and dialogue process that typically includes the following phases; 1) analysis, 2) policy formulation and planning, 3) implementation, and 4) monitoring and evaluation (FAO 2006). Many NFPs include a forest forum or similar multistakeholder platform to provide an opportunity for all relevant stakeholders within and outside of the forest sector to express their views on forest policy. As of 2008, 135 countries and areas had developed a forest policy and 131 had established a NFP (FAO, 2010a).

It is widely acknowledged that NFPs play an important role in fostering sustainable forest management and in ensuring that the forest sector contributes to sustainable development (FAO 2012). The NFPs are sometimes mistaken for “forest policy”, “forest strategy”, or even “forest law”. Instead, the NFP refers to a comprehensive mechanism that is used for developing forest policy, related strategies and action plans, and for facilitating and monitoring their implementation (FAO 2010b). The difference between a forest policy and a forest strategy is explained in Box 2.

Box 2. What is the difference between a forest policy and a forest strategy?

A forest policy is typically a government document in which long-term goals and objectives for forest sector’s contributions towards sustainable development are set. A forest strategy describes how these goals and objectives will be achieved. The forest strategy is supported in many countries, as appropriate, by separate forest legislation, which provides the legal framework for the implementation of the forest strategy. Action plans are then designed to operationalize the forest policy into concrete activities.

In the existing forest policies and strategies, the importance of FGR is recognized to a varying degree, and the action plans may not include specific activities on FGR. In cases where FGR is considered, the actions plans often emphasize FGR conservation and include a few, if any, activities promoting the use and development of FGR. Furthermore, the contributions of FGR conservation, use and development to sustainable forest management were rarely analysed systematically when the forest policies and strategies were prepared. To address these shortcomings, it is recommendable that countries prepare a specific national FGR strategy and also establish a national coordination mechanism on FGR. This can be done without duplicating efforts, either as part of, or in close collaboration with, the overall forest policies and the NFPs.

A national strategy for FGR is a roadmap and a specific action plan for the conservation, sustainable use and development of FGR at the national (or sub-national) level. It should be based on the status of FGR and their current level of management, and define targets for the conservation, sustainable use and development of these resources. The preparation and implementation of a national FGR strategy should be considered as a continuous process, including monitoring of progress against the targets and revision of the strategy (e.g. every 10 years), as needed. In addition to the targets, the national FGR strategy should identify priorities for improving the management of forest genetic resources and related actions, as well as clarify responsibilities and mobilize resources for its implementation. This cycle of a national FGR strategy should be synchronized with the similar cycle of a national forest strategy, when possible.

While the main purpose of the national FGR strategy is to translate the Global Plan of Action into concrete activities at the national level, it also contributes to the UN Strategic Plan for Forests 2017-2030, the 2030 Agenda and other relevant international commitments on forests. Therefore, the national FGR strategy should be fully in line with, and supportive to, other relevant national policies and strategies related to forests, biodiversity, climate change, energy, nutrition, poverty reduction and sustainable development.

National strategies as building blocks of regional strategies on forest genetic resources

Several regional networks on FGR have developed, or are in the process of developing, regional strategies for the implementation of the Global Plan of Action. For example, in 2014, the Asia Pacific Forest Genetic Resources Programme (APFORGEN) developed such regional strategy by identifying the most relevant strategic priorities of the GPA-FGR for the region. In 2017, APFORGEN updated the regional strategy for 2018-2022⁴ and it was welcomed by the FAO Asia-Pacific Forestry Commission

⁴ <http://www.apforgen.org/>

in the same year. Another example is provided by the Sub-Saharan Africa Forest Genetic Resources Programme (SAFORGEN) which also identified regional priorities and developed a draft regional strategy for the implementation of the Global Plan of Action.⁵

National FGR strategies are important building blocks for the development and implementation of regional strategies for the Global Plan of Action. When countries prepare a national action plan for the conservation, sustainable use and development of FGR, they typically also need to gather more and better data and information on FGR. This facilitates the development of regional strategies on FGR as the state of FGR conservation, use and development can then be better assessed also at regional level, and the regional strategies can better reflect the needs of different countries.

Further to developing regional strategies to support the overall implementation of the Global Plan of Action, national FGR strategies also serve as building blocks for more specific actions on FGR, such as development and implementation of regional *in situ* conservation strategies (Strategic Priority 11). The work of the European Forest Genetic Resources Programme (EUFORGEN) offers an example of this kind of more specific action at regional level. In 2015, EUFORGEN finalized the pan-European conservation strategy for FGR after several years of collaborative efforts. The overall goal of the conservation strategy is to maintain the adaptive and neutral genetic diversity of forest trees across their entire distribution range by establishing a core network of conservation units for FGR (de Vries et al. 2015). It also sets, based on a commonly agreed approach, a minimum conservation target for each country in which a given tree species occurs.

Purpose of the guidelines and how to use them

The purpose of these guidelines is to assist countries, especially developing countries, in preparing a national FGR strategy for the implementation of the Global Plan of Action and to promote the integration of forest genetic resources into other relevant national strategies and mechanisms, in particular forest strategies and the NFPs. The guidelines explain steps that may be followed while preparing the national FGR strategy and options for integrating the national FGR strategy with other relevant national strategies. It is recognized that countries may not manage FGR at national level but at sub-national level. Therefore, countries can decide at which level they may want to apply these guidelines.

Similarly to forest policy formulation and NFPs, there is no single approach for preparing a national FGR strategy as the situations and needs differ from country to country. Therefore, the guidelines suggest steps and options, and provide checklists of questions that countries may want to consider while preparing a national FGR strategy.

PREPARING THE NATIONAL STRATEGY FOR FOREST GENETIC RESOURCES

Preparatory analysis: gathering key background information

Sound data and information on a range of topics related to forests and FGR are needed for the preparation of a national FGR strategy. This is necessary to define where the country stands in terms of FGR conservation, use and development, and what it wants to achieve and in which timeframe. Furthermore, the data and information is needed to engage all stakeholders meaningfully in discussions and consultations.

It is recommendable to compile and review existing data and information on FGR, gather new data on FGR and conduct additional studies, as appropriate. The scale and depth of the preparatory work depends on the circumstances, human and financial resources, as well as the time available for this work.

⁵ <https://www.biodiversityinternational.org/research-portfolio/forests/saforgen/>

If a country has submitted reports to FAO for the SoW-FGR and/or for monitoring the implementation of the GPA-FGR, these reports offer a good starting point for the preparatory work.

The targets, indicators and verifiers for FGR, adopted by the CGRFA, provides a basic list of topics on which countries may consider gathering data and information for the preparatory analysis. At this step, countries may focus on Targets A.1-A.4 and B.4 and their indicators as they are most relevant for initiating the preparation of a national FGR strategy. Countries may consider the following questions:

- Has a national FGR strategy (or sub-national FGR strategies) already been developed? If so, is there a need to revise it?
- Is there a national (or sub-national) coordination mechanism(s) on FGR? If so, how well it is functioning?
- Who are the main stakeholders which should be involved in the preparation of a national FGR strategy?
- Have FGR conservation, use and development been integrated into a national (or sub-national) forest policy?
- Have FGR conservation, use and development been integrated into a national (or sub-national) biodiversity action plan(s)?
- Have FGR conservation, use and development been integrated into a national (or sub-national) adaptation strategy (-ies) for climate change?
- Is there an operational national (or sub-national) FGR inventory (-ies)? Is there an up-to-date national (or sub-national) FGR information system(s)?
- Is there an operational national (or sub-national) *in situ* conservation system(s) for FGR?
- Is there an operational national (or sub-national) *ex situ* conservation system(s) for FGR?
- Is there an operational national (or sub-national) tree seed system/programme(s)?
- Are there tree breeding programmes operating within the country? If so, which stakeholders are operating them?
- Have extension activities on FGR been carried out? If so, which stakeholders have been targeted and/or reached?
- Which organizations are participating in international research and development collaboration on FGR?

Establishment of a coordinating mechanism on FGR

In case there is no national coordinating mechanism on FGR in place, it is recommendable to establish such mechanism. It plays an important not only in the preparation of a national FGR strategy but also in its implementation and monitoring. There are several options for doing this, depending on the existing mechanisms dealing with forests and how the work on genetic resources is organized in a country across the agriculture, fishery and forest sectors. If a national coordinating mechanism on FGR already exists, it may be necessary to analyse how well it is functioning, and whether there is a need to change its institutional arrangement.

If a country has a NFP or similar arrangement in place, it is worth investigating a possibility for the NFP to assume the coordinating role, or to establish a FGR working group for this purpose. This arrangement would offer several benefits. Firstly, it would provide an immediate access to most, if not all, relevant stakeholders and a channel for creating awareness on the importance of FGR as part of sustainable forest management. Secondly, as the NFP and its stakeholders have already collected data and information on forest resources and perhaps even on FGR, this would allow a head start for the preparation of a national FGR strategy. Thirdly, the alignment of the national FGR strategy with the overall forest policy and strategy is likely to be easier if the coordinating mechanism on FGR operates as part of the NFP. Fourthly, the implementation of the national FGR strategy and monitoring the progress made can create synergies and reduce costs if done as part of the NFP work cycle.

Another option for establishing a coordinating mechanism on FGR is a national commission or committee on biological diversity, or a similar sectoral body covering genetic resources used in different agricultural sectors. This option offers somewhat similar benefits than the NFP option but additionally it is more likely than the NFP option to increase cross-sectoral collaboration on genetic resources. A potential risk of this option is that the national FGR strategy is not closely aligned with the forest strategy and that extra efforts are needed to reach and engage relevant stakeholders. However, there are several countries in which a sub-committee or a working group on FGR is operating successfully under the national committee on genetic resources and in close collaboration with country's NFP.

In some countries, the coordination responsibility is also given to a national FGR programme or network, which is a core group of national agencies and other stakeholders mandated by relevant ministry to carry out specific activities on FGR. The core group typically includes forest services and other agencies or companies (public and private) involved in the selection, procurement, documentation, storage and testing of forest reproductive material, an official body responsible for approving this material for international and/or domestic trade and maintaining a registry of the material, organizations tasked to manage national FGR conservation and tree seed systems, as well as research institutes and universities that carry out research and development work on FGR. However, the main activity of the national FGR programme is the development and implementation of specific activities on FGR.

Regardless of the option selected for establishing the coordination mechanism on FGR, experiences show that it is important to ensure a wide participation of different stakeholders. They include forest owners, farmers, local communities, indigenous people, private sector, non-governmental organizations, governmental organizations (including state-owned enterprises), research organizations (including universities), relevant ministries and other relevant stakeholders. Some countries have established coordinating mechanisms through legislation while others have used other measures for this purpose. Finally, it is also important that the relationship between the coordinating mechanism on FGR and other relevant national coordination mechanisms is well-defined, and that they do not compete with each other.

Alignment of national FGR strategy with relevant national policies and strategies

When initiating the preparation of a national FGR strategy, it is necessary to map the existing national policy and strategy "landscape" relevant for FGR. In many countries, this landscape includes a national forest policy, a national biodiversity strategy and an action plan, a national adaptation strategy to climate change and a national poverty reduction strategy, to name a few.

Such alignment is often rather straightforward in case of the national forest and biodiversity strategies but can be more changing with other strategies. Many countries have gained valuable experiences in mapping the national policy and strategy "landscape" while they have prepared their forest strategies and these experiences should be harnessed for the preparation of a national FGR strategy. The main result that the mapping exercise should achieve is an analysis of implications of relevant national policies and strategies for the conservation, use and development of FGR, and identification of challenges and opportunities for FGR.

Assessment of the status of FGR conservation, use and development

If available resources and time did not allow assessing the status of FGR conservation, use and development during the preparatory analysis, it is recommendable to conduct such in-depth analysis at this stage so that feasible and realistic targets can be later formulated as part of the national FGR strategy preparation. In addition to assessing the current status, the analyses should also identify gaps and needs for future work on FGR.

Similarly to the preparatory analysis, this step can also build on earlier prepared reports and the targets, indicators and verifiers for FGR presented in these guidelines (Annex 1). A basic assessment of the status of FGR conservation, use and developed can be done by focusing Targets B.1-B.3 and related indicators. Countries may consider the following questions during this step:

- For which species an up-to-date national distribution range is available?
- Which species have been characterized based on non-molecular information?
- Which species have been characterized based on molecular information?
- Which species have been included in *in situ* conservation system/programme(s)?
- How much of FGR are conserved in terms of *in situ* conservation units and their area, and where these units are located within the country?
- Which species have been included in *ex situ* conservation system/programme(s)?
- How much of FGR are conserved in terms of *ex situ* conservation units and their area, and *ex situ* accessions in seed and clone banks?
- Which species have been included in a national (or sub-national) tree seed system/programme(s)?
- How many seed stands and seed orchards there are for these species?
- Which species have been included in tree breeding programme(s)? At which state are the breeding efforts for these species?
- Is there capacity to produce planting stock through macro and/or micropropagation? If so, for which species this is being done and how much planting stock is produced annually?
- Does the production of forest reproductive material meet the demand?

Further to these questions, it is recommended to review and summarize any additional data and information on FGR that are available, including results of relevant studies and research projects.

Setting national goals and targets

Based on the mapping of the national policy “landscape” and the assessment of the status of FGR conservation, use and development, goals and targets can be formulated for the national FGR strategy. The strategy should be in line with, and supportive to, the existing national policies and their goals. Furthermore, the strategy should contribute to the implementation of the GPA-FGR, the UN Strategic Plan for Forests 2017-2030 and other international commitments on forests. The national FGR strategy should not have too many goals, and often a single high-level goal is enough to describe the purpose of the strategy. This would also facilitate communication efforts on the strategy.

The targets of the national FGR strategy should be specific and measurable, defining clearly what the strategy intends to achieve. It is recommended to formulate one or more targets in each of the four priority areas of the GPA-FGR as this would also facilitate the preparation of country progress reports on the implementation of the GPA-FGR. The targets of the GPA-FGR may be used as a starting point for formulating the national targets that reflect country’s priorities.

The national targets should also reflect what other relevant national strategies aim to achieve. For example, many countries have committed themselves to restoring large areas of forests and other wooded lands under various global and/or regional forest restoration initiatives. The national targets concerning the production of forest reproductive material should therefore take into account the needs of the forest restoration programmes in terms of the amount and type of the material required and species preferred.

Preparation of a national action plan

The purpose of a national action plan is to translate the targets into concrete activities. Under each target, a set of activities should be included into the action plan describing what will be done to achieve the target. Each activity should have a lead agency responsible for its implementation. Contributing agencies and stakeholders should also be listed. The action plan should also provide a timeframe, i.e. by when the activities and possible milestones along the way will be achieved. An important component of the action plan is a budget indicating what human and financial resources are needed to implement the activities.

Endorsement of the national FGR strategy

It is essential to obtain a high-level political endorsement to the national FGR strategy. Depending on the conditions and governance of a country, the endorsement could be sought from the ministry responsible for forests, or even from the government, which should also express a political commitment for the implementation of the strategy. This is also necessary for other relevant national strategies to take note of the national FGR strategy as this would create awareness on the importance of FGR among policymakers. Before the national FGR strategy is finalized, all relevant stakeholders should also have expressed their commitment to the strategy as this is often a requirement for obtaining the political endorsement.

IMPLEMENTING THE NATIONAL STRATEGY FOR FOREST GENETIC RESOURCES

Mobilizing resources

The implementation of the national FGR strategy will undoubtedly require additional financial resources and strengthening of institutional and human capacities, particularly in developing countries. In order to acquire adequate financial resources for the implementation of the national FGR strategy, it is often necessary to secure funding from different sources based on well-developed proposals including a realistic and detailed budget which is a basic requirement for resource mobilization.

As a first step, it should be analysed how much in-kind contributions various stakeholders and the agencies responsible for different activities could invest in the implementation of the national FGR strategy with their currently available resources. Secondly, the possibility of allocating domestic financial resources for the implementation of the strategy should be explored. These steps will then be useful for discussions with potential external donors and multilateral financing mechanisms which often require some level of co-funding from a recipient country and/or its agencies implementing the supported activities.

The role of national forest programmes and other relevant national mechanisms

The NFPs are considered as the main mechanism for implementing sustainable forest management. The NFPs have also significantly contributed to the implementation of forest-related commitments to the CBD. Furthermore, many countries have integrated climate change mitigation and adaptation into their NFPs. FAO has also developed a guidance document to support this integration (FAO 2011). For these reasons, the NFPs provide valuable lessons for the preparation and implementation of national FGR strategies and action plans. It is therefore recommended that national FGR strategies and action plans will be developed and implemented in close coordination and collaboration with the NFPs.

Monitoring and evaluation

Monitoring and evaluation is an essential part of any strategy implementation as it allows early detection of problems and possibilities for making adjustments to the action plan. At minimum, all stakeholders should meet annually or bi-annually, and agencies responsible for different activities should present their reports on progress made and resources used. This necessary not only for monitoring purposes but also for maintain stakeholders' commitment and sharing information and knowledge.

In addition to the stakeholder meetings, it is recommendable to prepare a separate monitoring and evaluation plan. It could include a mid-term and an end-of-cycle evaluations, and describe which indicators will be used for each target, and what data and information will be used as verifiers. Data and information collected during the preparatory analysis can be used as a baseline against which the progress made can be measured.

CONCLUDING REMARKS

[To be developed]

REFERENCES

- Beech, E., Rivers, M., Oldfield, S., and Smith, P.P. 2017. GlobalTreeSearch – the first complete global database of tree species and country distributions, *Journal of Sustainable Forestry*, DOI: 10.1080/10549811.2017.1310049
- Boyle, T.J. 2000. Criteria and indicators for the conservation of genetic diversity, in: Young, A. G., Boshier, D. H., Boyle, T. J. (Eds.), *Forest Conservation Genetics: Principles and Practice*. CABI Publishing, Wallingford, pp. 239–251.
- de Vries, S.M.G., Alan, M., Bozzano, M., Burianek, V., Collin, E., Cottrell, J., Ivankovic, M., Kelleher, C.T., Koskela, J., et al. 2015. Pan-European strategy for genetic conservation of forest trees and establishment of a core network of dynamic conservation units. *Bioersivity International*, Rome, Italy. 40 p.
- FAO 1987. Guidelines for forest policy formulation. *FAO Forestry Paper 81*.
- FAO 2006. Understanding national forest programmes: Guidance for practitioners.
- FAO 2010a. Global Forest Resources Assessment 2010. Main Report. *FAO Forestry Paper 163*. Food and Agriculture Organization of the United Nations, Rome.
- FAO 2010b. Developing effective forest policy: A guide. *FAO Forestry Paper 161*.
- FAO 2011. Climate change for forest policy-makers: An approach for integrating climate change into national forest programmes in support of sustainable forest management.
- FAO 2012. NFPs in practice: Ways to improve the implementation of national forest programmes.
- FAO 2014a. The State of the World's Forest Genetic Resources. Commission on Genetic Resources for Food and Agriculture, FAO, Rome.
- FAO 2014b. Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources. Commission on Genetic Resources for Food and Agriculture, FAO, Rome.

FAO 2016a. Global Forest Resources Assessment 2015. How are the world's forests changing? Second edition. Food and Agriculture Organization of the United Nations, Rome.

FAO 2016b. State of the World's Forests 2016. Food and Agriculture Organization of the United Nations, Rome.

Namkoong et al. 2002. Criteria and indicators for sustainable forest management: assessment and monitoring of genetic variation. Forest Genetic Resources Working Paper 37, FAO.

Spillane C, Engels J, Fassil H, Withers L, Cooper D 1999. Strengthening National Programmes for Plant Genetic Resources for Food and Agriculture: Planning and Coordination. Issues in Genetic Resources No. 8. International Plant Genetic Resources Institute, Rome, Italy.

UNEP/CBD/AHTEG 2011. Report of the Ad Hoc Technical Expert Group on Indicators for the Strategic Plan for Biodiversity 2011-2020, <https://www.cbd.int/doc/meetings/ind/ahteg-sp-ind-01/official/ahteg-sp-ind-01-03-en.pdf>.

ANNEXES

Annex 1. Targets, indicators and verifiers for forest genetic resources.

Policy responses of countries to the Global Plan of Action for the Conservation, Sustainable Use and Development of FGR		
Target A.1: Availability of data and information on FGR is increased	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
	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
Target A.2: National <i>in situ</i> and <i>ex situ</i> systems for FGR conservation are strengthened	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
	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
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	Verifier A.3.1.1: Number and list of countries with operational national tree seed programmes or similar arrangements
	Indicator A.3.2: Extent of tree breeding programmes	Verifier A.3.2.1: Number and list of countries with operational tree breeding programmes
	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
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	Verifier A.4.1.1: Number and list of countries with national coordination mechanisms on FGR
	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
	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 contribute to the implementation of regional or sub-regional FGR conservation strategy

State of conservation, use and development of FGR		
	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

Target B.1: FGR are regularly assessed and characterized	Indicator B.1.2: Characterization of FGR	Verifier B.1.2.1: Number and list of species which have been characterized based on non-molecular information (e.g. provenance trials, ecological or climatic zonation) Verifier B.1.2.2: Number and list of species which have been characterized based on molecular information (e.g. range-wide sampling of populations for molecular marker studies)
Target B.2: FGR are conserved <i>in situ</i> , and complementary <i>ex situ</i> measures have been implemented	Indicator B.2.1: Amount FGR conserved <i>in situ</i>	Verifier B.2.1.1: Number and list of species included in <i>in situ</i> conservation programmes Verifier B.2.1.2: Number of <i>in situ</i> conservation units by species Verifier B.2.1.3: Area (ha) designated and managed for <i>in situ</i> conservation by species
	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 Verifier B.2.2.2: Number of <i>ex situ</i> conservation units by species Verifier B.2.2.3: Area (ha) designated and managed for <i>ex situ</i> conservation by species Verifier B.2.2.4: Number of <i>ex situ</i> accessions (in seed and clone banks) by species
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)	Verifier B.3.1.1: Number and list of species included in national tree seed programmes Verifier B.3.1.2: Number and list of species included in tree breeding programmes
	Indicator B.3.2: Production of forest reproductive material	Verifier B.3.2.1: Area (ha) and number of seed stands by species Verifier B.3.2.2: Area (ha) and number of seed orchards by species Verifier B.3.2.3: Amount (average number per year) of planting stock produced through macro and micropropagation by species
	Indicator B.3.3: State of tree breeding programmes	Verifier B.3.3.1: Testing and selection cycle (by generation number) by species
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	Verifier B.4.1.1: Number of countries which have integrated FGR conservation and use into their national forest programme and/or national forest policy Verifier B.4.1.2: Number of countries which have integrated FGR conservation and use into their national biodiversity action plans and/or related policies

		Verifier B.4.1.3: Number of countries which have integrated FGR conservation and use into their national adaptation strategies for climate change
	Indicator B.4.2: Participation in regional/sub-regional collaboration on FGR	Verifier B.4.2.1: Number of countries participating in regional/sub-regional networks on FGR
	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