



Strategy 2023-2030

Conserving, restoring and sustainably managing forest and tree genetic resources in Asia and the Pacific

Contributing organizations

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- Institute of Forest and Wildlife Research and Development, Forestry Administration, Cambodia
- Research Institute of Forestry, Chinese Academy of Forestry, China
- Institute of Forest Genetics and Tree Breeding, India
- National Research and Innovation Agency (BRIN), Indonesia
- Forest Research Center, National Agriculture and Forestry Research Institute, Ministry of Agriculture and Forestry, Lao PDR
- Forest Research Institute Malaysia
- Forest Department Sarawak, Malaysia
- Forest Research Institute, Myanmar
- College of Forestry and Natural Resources, University of the Philippines, Los Baños
- Sri Lanka Forestry Institute
- Royal Forest Department and Department of National Parks, Wildlife and Plant Conservation, Thailand
- Viet Nam Academy of Forest Science
- Forest Resources Division, National Institute of Forest Science, Republic of Korea
- Alliance of Bioversity International and the International Center for Tropical Agriculture (CIAT)
- Asia Pacific Association of Forestry Research Institutions (APAFRI)

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Natural forests provide a range of ecosystem services in uplands but are affected by agriculture expansion. Xiengkhouang, Lao PDR. Credit: R.Jalonon/Bioversity International.

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Owner of a family nursery with native tree seedlings, Lao PDR.
Credit: R.Jalonen/Bioversity International



List of acronyms

APAFRI	Asia Pacific Association of Forestry Research Institutions
APFORGEN	Asia-Pacific Forest Genetic Resources Programme
CGFRA	Commission on Genetic Resources for Food and Agriculture
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
FAO	Food and Agriculture Organization of the United Nations
FGR	Forest Genetic Resources
IRD	Institute of Forest and Wildlife Research and Development, Cambodia
IUCN	International Union for Conservation of Nature
NBSAP	National Biodiversity Strategy and Action Plan
REDD+	Reducing Emissions from Deforestation and Forest Degradation

The **Asia-Pacific Forest Genetic Resources Programme** (APFORGEN) is a regional programme and network that brings knowledge and use of Asia's forest biodiversity to a new level – from a traditional focus on ecosystems and species to include genetic diversity that underlies ecosystem functioning, productivity, and adaptive capacity in a changing environment. APFORGEN brings relevant genetic knowledge from laboratories and specialists to forest managers, conservationists, restoration practitioners and policy-makers in an easily understandable form, helping them to manage the region's tree diversity for environmental and socio-economic benefits.

Through its network of geneticists, forestry professionals and funding partners in 15 Asian countries, APFORGEN shares knowledge and good practices, implements multi-country research and development projects, operates a Regional Training Centre and serves as a one-stop-centre on forest genetic resources (FGR) information and initiatives in the Asia-Pacific.

Our objectives

1. Mobilize political and financial support for integrated management of forest genetic resources in land use, biodiversity and climate policies, strategies and programmes
2. Make information about the region's forest and tree genetic resources available and accessible to support their sustainable management and research
3. Develop conservation and sustainable use strategies for regionally important and threatened tree species
4. Strengthen tree seed systems to facilitate ecosystem restoration, support local livelihoods and climate change adaptation and mitigation

APFORGEN's member countries (2023)

- Bangladesh
- Cambodia
- China
- India
- Indonesia
- Lao PDR
- Malaysia
- Myanmar
- Nepal
- Pakistan
- Philippines
- Republic of Korea
- Sri Lanka
- Thailand
- Vietnam



Safeguarding forest genetic resources is crucial for sustainable development

The decade from 2020 to 2030 is defining for life on Earth. Previous withdrawals of nature's capital are becoming due, as illustrated by the increasingly frequent and devastating droughts, storms, floods and fires across Asia and the Pacific, and pest and disease outbreaks such as the Covid-19 pandemic. The global community has identified 2030 as the deadline for avoiding catastrophic consequences of the climate change and biodiversity loss: by the end of the decade, humanity must halve greenhouse gas emissions¹, conserve at least 30% of ecosystems, restore 30% of degraded ecosystems, and halt the extinction of

threatened species² – and all this while reducing poverty and ending hunger.

The global biodiversity and climate targets are not new, but what is new is the growing realization that they cannot be met without conserving and restoring the genetic diversity of the species and populations which underlie the functioning, resilience and productivity of ecosystems. Forests and trees cannot mitigate climate change without the genetic diversity that allows them to withstand increasingly adverse growth conditions. Area-based conservation targets are futile if they don't ensure viable populations of species. Restored

¹ Intergovernmental Panel on Climate Change. Synthesis Report of the Sixth Assessment Report. www.ipcc.ch/ar6-syr/

² Convention on Biological Diversity. 2022. Kunming-Montreal Global Biodiversity Framework. www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf

ecosystems will fail to provide the expected ecosystem services and returns on investments if they are started with inbred, poorly adapted seeds. With the Kunming-Montreal Global Biodiversity Framework of 2022, countries of the world recognized for the first time the need to maintain and restore the genetic diversity of not only domesticated but also wild species, bringing the genetic diversity of the vast majority of the world's trees and shrubs under global concern.

The broadening understanding of the fundamental role of genetic diversity is significant for the conservation and sustainable use of the tens of thousands of tree species found in Asia and the Pacific. More than a thousand tree species are reported to be used in the region for diverse purposes, including timber, food, fodder, medicine, energy, and other ecosystem services³. Yet, the region also has more threatened tree species than any other part of the world, numbering more than 1700.³ The high prevalence of endemism in Asia and the Pacific makes native tree species extremely vulnerable to habitat degradation and climate-related risks. This, in turn, undermines their ability to provide food, other goods, and ecosystem services for the region's 4.5 billion people and rapidly growing economies.

Challenges in genetic conservation

Techniques for analyzing and using genetic diversity have advanced rapidly, and genetic sequencing is now available at a fraction of the cost and time compared to just a decade ago.

Novel techniques also allow associating genetic diversity patterns with adaptive traits, supporting, among others, the identification of drought- or heat-resistant provenances, and management practices that increase ecological resilience. Nevertheless, knowledge of genetic diversity patterns is still available for only a fraction of tree species – at a global level, for less than

5% of all known species – and the capacities for analysis are highly unevenly distributed, concentrated in high-income countries and temperate and commercially important species³. In most countries in the Asia-Pacific, land users, extension providers, policymakers, and researchers have little or no access to genetic information on native trees to guide management actions. Genetic resources of the region's unique tree species are rapidly eroding before we even begin to understand their extent and potential values.

That said, better use of genetic information to inform species and ecosystem management is also hampered by a limited understanding of genetic diversity and its foundational role in ecosystem productivity and resilience. While novel research technologies provide invaluable insights into adaptation, in many cases, species management practices and outcomes could already be significantly improved through well-planned use of common methods such as population surveys, germination tests, and common garden trials, and applying management recommendations based on genetic theory and species traits.

The current climate and biodiversity crises can only be met through better conservation and use of forest genetic resources. At the same time, the genetic diversity and the evolutionary potential of tree species can only be effectively conserved if it is integrated into the implementation of wider programmes and strategies of sustainable management. Strengthening land managers' and policymakers' awareness of the importance of genetic diversity, and their technical and institutional capacities to integrate genetic diversity management in land use plans is, therefore, of utmost importance.

³ FAO 2014. State of the World's Forest Genetic Resources. Commission on Genetic Resources for Food and Agriculture. FAO, Rome, Italy. Available from: <http://www.fao.org/3/a-i3825e.pdf>. Based on the country reports of 20 countries in the region: Azerbaijan, China, India, Indonesia, Japan, Kazakhstan, Kyrgyzstan, Myanmar, Nepal, Philippines, Republic of Korea, Sri Lanka, Thailand, Uzbekistan; Australia, Cook Islands, Fiji, Papua New Guinea, Solomon Islands, and Vanuatu.

APFORGEN's approach

The Asia Pacific Forest Genetic Resources Programme (APFORGEN) developed this Strategy 2023-2030 in recognition of the unique ecological and socio-economic value of the region's forest and tree genetic resources and the urgency to conserve them. The objectives of the strategy were identified by APFORGEN's National Coordinators, building on the national and regional needs and priorities that emerged during the implementation of the **Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources** of the Food and Agriculture Organization of the United Nations (FAO)⁴ and the network's previous strategy in the member countries from 2018 to 2022. The strategy is aligned with the strategic priorities of the Global Plan of Action, and with the targets and indicators of the **Kunming-Montreal Global Biodiversity Framework**, which provides the broader framework for the role of biodiversity in achieving sustainable development by 2030-2050.

Distributions of most tree species do not follow national boundaries, and they hold great potential for improvement and enhanced sustainable use across country borders. Through regional networking it is possible to gain synergy in research and conservation activities, avoid overlapping efforts, accelerate learning and manage the constraints posed by limited resources. APFORGEN, established in 2003, is the only network in Asia and the Pacific that focuses on the conservation, restoration, and sustainable use of forest and tree genetic resources. APFORGEN's broad membership and long-term experience in developing and implementing collaborative research and capacity development initiatives make it ideally suited for coordinating regional cooperation on forest and tree genetic resources in close collaboration with FAO and other relevant national, regional, and international organizations. The Asia Pacific Forestry Commission,

the highest decision-making body on forestry in the region, recognized that APFORGEN offers substantial opportunities for regional collaboration, and invited APFORGEN to regularly report on its work to the Commission⁵. A review of the implementation of the Global Plan of Action in 2019-2023 demonstrated that regional forest genetic resources networks provide important technical support to countries in genetic conservation and management and facilitate countries' access to funding⁶.



Farmer grafting plants of critically endangered Siamese Rosewood (*Dalbergia cochinchinensis*), Cambodia. Credit: IRD

⁴ Commission on Genetic Resources for Food and Agriculture. 2023. Preliminary Second Report on the Implementation of the Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources. www.fao.org/3/cc4380en/cc4380en.pdf

⁵ Asia-Pacific Forestry Commission. 2018. Twenty-seventh session. Report. www.fao.org/3/18876EN/18876en.pdf

⁶ Commission on Genetic Resources for Food and Agriculture. 2023. Preliminary Second Report on the Implementation of the Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources. www.fao.org/3/cc4380en/cc4380en.pdf

Twenty years of regional collaboration on forest genetic resources

- 2003** APFORGEN was established as a network of 14 Asian countries
- 2004-2006** Annual meetings of National Coordinators
- 2006** Grant from the International Tropical Timber Organization for strengthening national programmes on forest genetic resources
- 2006-2008** Annual training workshops for young scientists and forest managers
- 2009** International Symposium on Forest Genetic Resources
- 2010** Training workshop for scientists and forest managers
- 2011-2012** Regional workshops to support the development of the State of the World's Forest Genetic Resources Programme
- 2014** APFORGEN aligns its programme of work with the Global Plan of Action on Forest Genetic Resources
- 2016** Regional Training Centre on Forest Genetic Resources is established
- 2017** Republic of Korea joins APFORGEN as its 15th member country
- 2017** The Asia Pacific Forestry Commission recognizes that APFORGEN's Strategy 2018-2022 offers substantial opportunities for regional collaboration
- 2019** The regional initiative 'APFORGIS' publishes updated distribution and threat maps for 72 regionally important tree species
- 2022** IUCN updates the Red List assessment of Siamese and Burmese Rosewoods to 'Critically Endangered', following APFORGEN's study on the species' conservation status
- 2022** APFORGEN wins UK Darwin Initiative's new Capacity and Capability grant for strengthening tree seed systems in four member countries
- 2023** New strategy for the years 2023-2030 is launched and presented to the Asia Pacific Forestry Commission

Global Plan of Action on Forest Genetic Resources

The *Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources* (FGR) is a strategic framework for the conservation and sustainable use of genetic resources of trees and other woody plants. It is based on the findings of the first *State of the World's Forest Genetic Resources* report which was published by FAO in June 2014. The report was developed on the basis of 86 country reports covering 85 percent of the world's forested area, input from regional consultations, and a series of thematic studies developed by experts around the world.

The Global Plan of Action has 27 Strategic Priorities, grouped into four 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 Strategic Priorities for Action constitute a comprehensive global programme of work. They assist countries in integrating FGR conservation and management needs into wider policies, programmes, and frameworks of action from local to national, regional and global levels, and in developing sound technical and scientific programmes for the successful management of FGR. The implementation of the Global Plan of Action is supported by a set of targets, indicators, and verifiers for monitoring, as well as a funding strategy, the purpose of which is to support particularly developing countries in implementation.

Progress with the implementation of the Global Plan of Action was reviewed from 2017 to 2018 and again from 2019 to 2023. Reports received by FAO from a total of 66 countries confirmed progress with the implementation and indicated that awareness of forest genetic resources had improved in countries participating in the process. At the same time, the results showed that efforts are constrained by limited financial and human resources, which allow countries to conserve only the most common forestry and agroforestry species, continuing to leave a vast number of species with little protection.

The second *State of the World's Forest Genetic Resources Report* is scheduled for publication in June 2024. The Intergovernmental Technical Working Group on Forest Genetic Resources, which regularly reviews the progress in implementing the Global Plan of Action, recommended that the Global Plan of Action is then promptly reviewed based on the findings of the Report, and revised as deemed necessary.

The Global Plan of Action on FGR is available from <http://www.fao.org/3/a-i3849e.pdf>



Field excursion in Silent Valley National Park, Kerala, India.
Credit: R.Jalonen/Bioversity International

APFORGEN'S OBJECTIVES 2023-2030

In a meeting of its National Coordinators in March 2023, APFORGEN identified four objectives for regional collaboration on the conservation, restoration, and sustainable management of the region's forest and tree genetic resources for the years 2023-2030. The meeting reaffirmed the continued importance of APFORGEN's thematic areas and identified updated action needs and targets for each objective and their contributions to the Global Biodiversity Framework and the Global Plan of Action on Forest Genetic Resources.

1. Mobilize political and financial support for integrated management of forest genetic resources in land use, biodiversity and climate policies, strategies, and programmes

Although forest genetic resources in many Asian countries have been severely depleted, there is limited recognition about their crucial ecological and societal importance, including for timber production,

nutrition and health, forest and landscape restoration, and adaptation to and mitigation of climate change. Political and institutional support for conserving the resource base has not kept pace with the economic development in the region. Forest genetic resources are commonly perceived as a highly technical field relevant and accessible only to geneticists, tree breeders, and other specialists. National forest- or biodiversity-related strategies and action plans typically lack mention of genetic conservation measures for tree species. Forest managers, restoration practitioners, and conservationists are often not well informed

about the relevance of genetic aspects to meeting their objectives. Lack of understanding of FGR and their importance for policy and practice constrains the conservation and sustainable use of tree species, increases genetic risks, limits adaptation to climate change, and reduces returns on investments.

These challenges highlight the need for strengthening efforts to widen decision-makers and land managers' understanding of the contribution of forest and tree genetic resources to societies and to share knowledge, experiences, and good practices in their conservation and sustainable use. At the same time, across the region there are many institutions and actors with advanced capacities and good practices in coordinating and managing forest genetic resources through national and subnational programmes and platforms. Through regional collaboration in capacity building, these practical experiences and lessons learned can be shared, tested, and adapted in new countries.

This objective has the following targets:

- Secured funding for multi-country research and development initiatives to implement APFORGEN's strategy and to sustain regional collaboration and knowledge exchange
- Training of at least 200 forestry experts and 40 decision-makers from APFORGEN's member countries in integrating genetic considerations in policies, strategies, and management plans by the Regional Forest Genetic Resources Training Centre
- Actively operating national networks and platforms on forest genetic resources that bring together stakeholders across multiple levels and institutions in member countries
- Incorporation of forest genetic resources into national and regional policies, strategies, and planning processes related to the conservation and sustainable use of biodiversity, land restoration, and the mitigation of and adaptation to climate change

The Regional Training Centre will integrate results of APFORGEN's research and development projects in its approaches and materials, and organize short courses, on-the-job training, and in-person and virtual workshops and events. APFORGEN will seek collaboration with higher education institutions and other stakeholders in the region to help develop needs-based learning materials and support their wider adoption. Learning resources will be freely available and translated into multiple national languages.

The work under this objective contributes particularly to the following global biodiversity and sustainable development targets:

Global Plan of Action on Forest Genetic Resources⁷

- Target A.4: National coordination mechanisms on FGR are created, and national strategies for FGR conservation and use are developed and implemented
 - Target B.4: Policies and capacities supporting FGR conservation and sustainable use are strengthened
-

Global Biodiversity Framework⁸

- Target 13: Fair and equitable sharing of benefits from genetic resources, digital sequence information and associated traditional knowledge
 - Target 14: The multiple values of biodiversity are integrated into decision-making at all levels
 - Target 19: Financial resources increased to \$ 200 billion per year, including \$ 30 billion through international finance
 - Target 20: Capacity-building and development, technology transfer, and technical and scientific cooperation for implementation is strengthened
-

⁷ www.fao.org/forest-genetic-resources/global-plan-of-action/monitoring-tools/en/

⁸ Convention on Biological Diversity, 2022. Kunming-Montreal Global Biodiversity Framework. www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf

2. Make information about the region's forest and tree genetic resources available and accessible to support their sustainable management and research

Development of effective conservation and management strategies for tree genetic diversity starts with understanding species distributions. Up-to-date estimates of species distribution will provide the necessary basis for studies on genetic diversity and its distribution, assessing the impacts of climate change on tree species and the ecosystem services they provide, and designing networks of genetic conservation units and seed production areas to support tree planting and restoration efforts. Unfortunately, even this basic knowledge of species is lacking for the majority of Asian tree species. For example, the proportion of data-deficient species and species for which conservation status has not been assessed on the IUCN Red List of Threatened Species is 31% of all known species of the region⁹, the highest in the world. Since 2018, APFORGEN has developed up-to-date distribution and threat maps for tens of socio-economically species, but in the region of an estimated 19,000 tree and shrub species and high diversity between countries, the work has only started.

Accumulating experiences from APFORGEN's work underline the fundamental importance of data quality, comparability and information management, as well as the need to strengthen in-country capacities for data management, modeling and analysis to enable scaling of the work. The distribution ranges of many socio-economically important tree species span several countries, and collaboration on information management allows countries to benefit from synergies and good data management practices.

This objective has the following targets:

- Protocols and tools for documenting species' distributions, genetic diversity, and functional traits, including local and traditional knowledge
- Distribution and threat maps for 100 priority tree species native to the Asia-Pacific region
- Adoption of regional guidelines for establishing genetic conservation units and quality seed sources in member countries
- Up-to-date regional information system on species distributions and genetic conservation units



⁹ Botanic Gardens Conservation International. 2021. State of the World's Trees. bgci.org/wp/wp-content/uploads/2021/08/FINAL-GTARReportMedRes-1.pdf

Species selection will focus on socio-economically important and threatened species and species with cross-border distributions which will particularly benefit from regional collaboration. The resulting guidelines and resources will help improve conservation, restoration and management strategies for species at risk (APFORGEN's objectives 3 and 4). Countries will be able to adopt guidelines and protocols for species of their own interest, including locally important and endemic species.

The work under this objective contributes particularly to the following global biodiversity and sustainable development targets:

Global Plan of Action on Forest Genetic Resources

- Target A.1: Availability of data and information on FGR is increased
 - Target B.1: FGR are regularly assessed and characterized
-

Global Biodiversity Framework

- Target 21: Data, information and knowledge for decision-making is available
-



Seed orchard of Critically Endangered Siamese Rosewood (*Dalbergia cochinchinensis*) in Thailand. Credit: S. Tangmitcharoen

3. Develop conservation and sustainable use strategies for regionally important and threatened tree species

If conservation strategies are to reverse the decline of threatened tree species, they must focus on mapping, characterizing, conserving, and restoring genetic diversity. Without genetic diversity, species' populations lose their capacity to regenerate and adapt to changing environments. Species require different conservation approaches to maintain and restore genetic diversity, depending on their biological characteristics, distributions, uses, and threats. The vast species richness in Asia-Pacific countries, combined with often limited resources and capacities, severely hampers effective conservation planning.

Regional collaboration on species and genetic conservation will help develop and refine conservation strategies based on shared knowledge and experiences. Although species may differ between countries, functional traits can help identify effective conservation approaches that apply to multiple species sharing similar traits. Regional collaboration also allows range-wide approaches that are ultimately needed for effective species conservation; populations in different parts of the range are uniquely adapted to their environmental conditions and may harbor genetic resources for improving productivity and adaptation not found anywhere else. Advances in genetic and genomic research enable linking genetic diversity with adaptive traits such as heat and drought tolerance, which support the mitigation of and adaptation to climate change. Lastly, research capacities among Asia-Pacific countries are highly unevenly distributed, and regional collaboration contributes both to range-wide conservation planning and to capacity development.

Priority species for regional collaboration include agarwoods (*Aquilaria* spp.), rosewoods (*Dalbergia* spp.), and Ramin (*Gonystylus bancanus*), all of which are listed on the **Convention on International Trade in Endangered Species of Wild Fauna and Flora** (CITES,

Appendix II)¹⁰. Other socio-economically important yet threatened priority genera and species identified by multiple APFORGEN member countries include dipterocarps (e.g. *Dipterocarpus* spp., *Hopea* spp., *Shorea* spp.), *Pterocarpus* spp., sandalwood (*Santalum* spp.), and Teak (*Tectona grandis*). Activities under this objective will facilitate regional networking and collaboration to study and conserve additional species and genera that are of interest to policymakers, land managers and researchers in two or more APFORGEN member countries.

This objective has the following targets:

- Genetic diversity, traits associated with adaptation, and their geographic distribution identified for priority species, using state-of-the-art methods comparable between countries of distribution
- Guidelines for germplasm collection and genetic conservation for priority species, adopted by stakeholders in APFORGEN member countries
- Collected, characterized, and conserved germplasm of priority species, using appropriate combinations of *in situ*, *ex situ*, and on-farm methods to back up natural populations, avoid extinctions, and support sustainable use
- Material transfer agreements, multi-country species, and provenance trials between member countries for gene conservation, restoration, and tree breeding purposes
- Active species- or genus-specific working groups to support networking, knowledge, and material exchange on common priority species, working in partnership with regional and international organizations on the conservation and sustainable use of the species

The work under this objective contributes particularly to the following global biodiversity and sustainable development targets:

¹⁰ CITES. 2023. Appendices I, II and III. Valid from 21 May 2023. cites.org/sites/default/files/eng/app/2023/E-Appendices-2023-05-21.pdf

Global Plan of Action on Forest Genetic Resources

- Target A.2: National *in situ* and *ex situ* systems for FGR conservation are strengthened
- Target B.2: FGR are conserved *in situ*, and complementary *ex situ* measures have been implemented

Global Biodiversity Framework

- Target 4. Threatened species are recovering, genetic diversity is being maintained and human-wildlife conflict is being managed
- Target 5. Use, harvesting, and trade of wild species is sustainable, safe, and legal
- Target 10. Areas under agriculture, aquaculture, fisheries, and forestry are managed sustainably

4. Strengthen tree seed systems to facilitate ecosystem restoration, support local livelihoods, and climate change adaptation and mitigation

Well-functioning supply systems for tree seed are crucial for forestry, agroforestry, and forest and landscape restoration. Many Asia-Pacific countries have established national restoration targets, often accompanied by large-scale tree planting and restoration programmes. The combined area of these targets exceeds 50 million hectares by 2030. To succeed, such programmes require enormous amounts of genetically diverse, quality forest reproductive material, including tree seeds, seedlings, and vegetatively propagated material.

In practice, investments in seed and seedling production capacity in Asia-Pacific countries lag severely behind restoration targets. The demand, especially for native species, is completely unprecedented, and few species have designated seed production areas or seed orchards for quality seed production in required volumes. For the vast majority of species, remnant natural forests, which have suffered from decades of overexploitation, habitat loss, and degradation, are the only available sources of seed and seedlings. They commonly yield inbred seed that germinates and grows poorly and is susceptible to abiotic and biotic threats. Seed supply chains and quality assurance mechanisms are often non-existent for native species. Restoration practitioners widely



Endangered Dipterocarp species planted to mark APFORGEN's 20th anniversary in 2023, Malaysia.
Credit: R.Jalonen/Bioversity International

report that supply and quality constraints force them to use suboptimal species, delay activities, and increase costs. Weak supply chains also represent missed income and job opportunities for local actors who could benefit from participating in supply chains. The potential of natural regeneration as a restoration method is not fully recognized, and it, too, depends on the availability of adequately diverse seed sources.

Restoration practitioners and supply chain actors across the region need better technical capacities to demand and produce genetically diverse, quality forest reproductive material. With the unprecedented and ambitious restoration targets, accelerating learning on good practices in seed system development will be crucial for success. Countries will benefit from collaboration to study and share information on provenance selection, seed source management, seed collection, and propagation practices to boost quality seed production for species of common interest. They will also benefit from sharing experiences in developing and implementing information systems, quality assurance, and incentive mechanisms on seed and seedling availability and quality. Exchange of quality material can be important, especially for restoring rare and threatened species and for enhancing the adaptive capacity of restored forests in areas predicted to be vulnerable to the impacts of climate change. Material exchange can also benefit producers through expanding market opportunities. Currently, the uncontrolled transfer of low-quality material, often of unknown origin, poses risks of maladaptation and genetic contamination and hampers the development of seed markets where quality is appreciated and rewarded.

This objective has the following targets:

- Tools and capacities for selecting and collecting genetically diverse, productive, and resilient forest reproductive material available in multiple national languages
- Identified and filled gaps in the availability and quality of seed sources to support restoration and tree-planting goals
- Policy guidance on supportive policy and regulatory environment for the adequate production and distribution of quality forest reproductive material

- Good practices and case studies on effective seed supply systems for forest and landscape restoration, including the participation of local communities, indigenous peoples, and small-scale suppliers
- Up-to-date, accessible information systems on seed sources in APFORGEN member countries

The work under this objective contributes particularly to the following global biodiversity and sustainable development targets:



Global Plan of Action on Forest Genetic Resources

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

Global Biodiversity Framework

- Target 2: 30% of degraded areas are under effective restoration
- Target 11: Nature's contributions to people are restored, maintained, and enhanced



Seeds of native tree species at the Institute of Forest Genetics and Tree Breeding, Coimbatore, India.
Credit: R.Jalonen/Bioversity International



Seed laboratory of the Institute of Forest and Wildlife Research and Development, Cambodia.

Credit: R.Jalonen/Bioversity International

IMPLEMENTATION

APFORGEN's four strategic objectives are in line with the Strategy for the Implementation of the Global Plan of Action on FGR¹¹, which recommends supporting countries in developing national and regional strategies and securing adequate and sustainable funding, as well as supporting relevant regional and global networks and advocating together for the conservation and sustainable use of forest and tree genetic resources.

To support the effective implementation of the Global Plan of Action and the Kunming-Montreal Biodiversity Framework and harness the full potential of forest and tree genetic resources for sustainable development in Asia-Pacific, APFORGEN seeks to:

- Advocate for and support the integration of conservation, restoration, and sustainable use of forest and tree genetic resources into relevant processes and programmes, from local to national and regional levels. This will not only help conserve genetic diversity but also help implement the wider land use, biodiversity, climate, and restoration programmes more effectively by enhancing productivity and adaptive capacity. Relevant programmes include, but are not restricted to, national forest and land use policies and legislation, National Forest Programmes, National Biodiversity Strategies and Action Plans (NBSAP), National Adaptation Plans for Climate Change, REDD+, and national and regional strategies for forest and landscape restoration.
- Establish partnerships with research, extension, and education institutions, civil society organizations, and the international community

¹¹ CGRFA. 2015. Fifteenth Regular Session of the Commission on Genetic Resources for Food and Agriculture. www.fao.org/3/a-mm660e.pdf

to pool expertise, share good practices, build on synergies, and raise the visibility of forest and tree genetic resources and their contribution to sustainable development.

- Mobilize expert working groups around emerging issues and opportunities, including membership of both APFORGEN and external experts where relevant
- Strengthen both technical and institutional capacities through the Regional Training Centre on Forest Genetic Resources and its learning materials, resources, and opportunities. The Training Centre has the key role in translating the results of APFORGEN's projects and programmes into formats that are accessible and tailored to the needs of different stakeholder groups. The Training Centre will also serve as a link to other regions of the world by integrating global good practices, the latest research, and experiences in forest genetic resources management in its training programmes.
- Mobilize resources for implementing this programme of work through regional research and development projects, but also through seeking long-term core commitments that help transform forest genetics research and management from project-based towards programme-based approaches with sustained impacts. Contributions to support strategic planning, communication, and policy dialogue will also be invaluable to enable continued regional collaboration on forest genetic resources, ensure its relevance to national and regional stakeholders, and grow its impacts.
- Regularly monitor the progress in implementing this strategy regionally and within member countries and report about its progress to the Asia-Pacific Forestry Commission, the Commission on Genetic Resources for Food and Agriculture, and other relevant international, regional and national bodies.

APFORGEN cordially invites countries and institutions in the region, the private sector, and the international community to collaborate with the network and invest human and financial resources for the implementation of the Global Plan of Action on FGR in the region. Forestry authorities, national and regional research

organizations in the Asia-Pacific region are welcome to join as network members.

How APFORGEN operates

Each member country of APFORGEN appoints a National Coordinator to serve as a link between the country and the network. The National Coordinators elect among themselves a Chair, up to two Vice-Chairs, and a Secretary to coordinate the network's activities, for a three-year term at a time. APFORGEN's day-to-day activities are managed by a Secretariat, typically hosted by the Chair's organization. The Alliance of Bioversity International and CIAT, a CGIAR research centre, provides technical support to APFORGEN. APFORGEN also collaborates closely with the Asia Pacific Association of Forestry Research Institutions (APAFRI) and the Food and Agriculture Organization of the United Nations (FAO). Forestry authorities and national and regional research organizations in Asia and the Pacific are welcome to join APFORGEN to benefit from and support the conservation and sustainable use of the region's unique forest genetic resources.



Population survey of remnant rosewood trees on farms, Lao PDR. Credit: FRC, NAFRI.

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