

# Strategy 2018-2022:

Implementing the Global Plan of Action on Forest Genetic Resources in Asia and the Pacific



ASIA PACIFIC FOREST GENETIC RESOURCES PROGRAMME

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### **Contributing organizations**

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- Research Institute of Forestry, Chinese Academy of Forestry, China
- Institute of Forest Genetics and Tree Breeding, India
- Center for Forest Biotechnology and Tree Improvement, Ministry of Environment and Forestry, Indonesia
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- Viet Nam Academy of Forest Science
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**Bioversity International** is a global research-for-development organization. We deliver scientific evidence, management practices and policy options to use and safeguard agricultural biodiversity to attain sustainable global food and nutrition security. We work with partners in developing countries where agricultural biodiversity can contribute to improved nutrition, resilience, productivity and climate change adaptation. Bioversity International is a member of the CGIAR Consortium, a global research partnership for a food secure future.

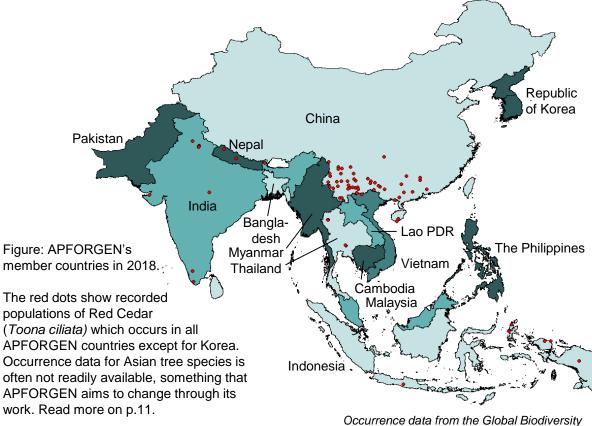
Cover photo: Shorea macrophylla, Indonesia – Credit: Rizky A.

**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 or species diversity to include genetic diversity that underlies ecosystem functioning, productivity and adaptive capacity. 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 societal 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 information and initiatives in the Asia-Pacific.

#### Our objectives 2018-2022

- Mobilize political and financial support for the implementation of the Global Plan of Action on Forest Genetic Resources in the Asia-Pacific region
- Make available information about the forest genetic resources in the region
- Develop conservation and sustainable use strategies for regionally important and threatened tree species
- Strengthen tree seed supply systems to facilitate ecosystem restoration, support local livelihoods and climate change adaptation and mitigation



Information Facility (www.gbif.org, March 2018)

# **Message from the Chair**

Forest genetic resources (FGR) are the diverse genetic materials maintained within and among forest tree species that are of actual or potential economic, environmental, scientific or societal value. They are crucial to the adaptation and protection of our ecosystems, landscapes and production systems, yet are subject to increasing pressures and irrational use. FGR needs to be managed in a sustainable way to ensure that present and future generations continue to benefit from forest trees.

APFORGEN is a programme and network that works to enhance the conservation and sustainable use of FGR in the Asia Pacific region. APFORGEN aims to support and link national forest programmes, research institutions, NGOs and individuals interested in FGR in the region. It collaborates with the FAO to implement the Global Plan of Action for Forest Genetic Resources in the Asia-Pacific region.

Zheng Yongqi, Chair of APFORGEN 2017-2019



Photo: Prof. Zheng addressing the IUFRO World Congress – Credit: IISD

# Members of the Executive Committee 2017-2019

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# SAFEGUARDING THE GLOBALLY IMPORTANT FOREST GENETIC RESOURCES OF ASIA AND THE PACIFIC

According to the first-ever report on the State of the World's Forest Genetic Resources, more than a thousand tree species in Asia and the Pacific are actively managed, for diverse purposes such as timber, non-timber forest products, energy and other ecosystem services – a reflection of the enormous ecological and cultural diversity of the region. Yet, the region also has more threatened tree species than any other part of the world, numbering more than 1700, according to the same report<sup>1</sup>. The high prevalence of endemism in Asia and the Pacific makes tree species extremely vulnerable to habitat degradation. 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.

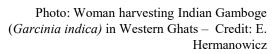
### Why is genetic diversity needed?

Genetic diversity provides the foundation for the survival of tree species, their growth and

productivity, and adaptation to a changing environment. It forms the basis for present and future selection and breeding programmes, and contributes food sources for humans and animals, including at times when annual crops fail. Hence, tree genetic diversity provides the foundations for forest and landscape management projects and programmes— for example, sustainable management of production forests, forest and landscape restoration, ecosystem-based approaches to mitigating climate change, community forestry and species conservation programmes. The genetic diversity and evolutionary potential of tree species can only be effectively conserved if it is integrated in the implementation of wider programmes and strategies of sustainable management.

### **Challenges in genetic conservation**

Conservation and sustainable use of forest genetic resources (FGR) is made difficult by the fact that knowledge of genetic diversity patterns is only available for a fraction of all tree species – at a global level, for less than 1% of all species  $^2$ .





<sup>&</sup>lt;sup>1</sup> 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. Source: FAO 2014. State of the World's Forest Genetic Resources. Commission on Genetic Resources for Food and Agriculture. FAO, Rome, Italy. Available from: <u>http://www.fao.org/3/a-i3825e.pdf</u> <sup>2</sup> FAO 2014, as above

Genetic resources are rapidly being eroded before we even begin to understand their extent and potential value. In light of this race against time and with limited financial and human resources, regional collaboration and coordination are of utmost importance for the conservation and sustainable use of tree species and their genetic resources.

Distributions of most tree species do not follow national boundaries, and they hold great potential for improvement and enhanced sustainable use across country borders. At the same time, trees are threatened by illegal cross-border trade and unsustainable resource acquisition. 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 <sup>3</sup>.

### **APFORGEN's approach**

The Asia Pacific Forest Genetic Resources Programme (APFORGEN) has developed this fiveyear Strategy 2018-2022 in recognition of the unique ecological and socio-economic value of the region's forest genetic resources and the urgency to conserve them. The strategy is aligned with 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) that identifies priority actions at national, regional and international levels based on an extensive global study of the current status of these resources. 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 preparation of the first State of the World's Forest Genetic Resources report.

APFORGEN, established in 2003, is the only network in Asia and the Pacific that focuses on the conservation and sustainable use of forest genetic resources. APFORGEN's broad membership and long-term experience in developing and implementing collaborative research and capacity development initiatives make it ideally placed for coordinating the implementation of the Global Plan of Action in the region in close collaboration with FAO and other relevant national, regional and international organizations.



Photo: Fruits and seed of *Myristica* (wild nutmeg), Niah National Park, Sarawak, Malaysia – Credit: R. Jalonen

<sup>&</sup>lt;sup>3</sup> FAO 2014. The 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, Italy. Available from: http://www.fao.org/3/a-i3849e.pdf

# 15 years of regional collaboration on forest genetic resources

2003	APFORGEN is established
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, and invites APFORGEN to regularly report on the progress made in its implementation to the Commission



Photo: APFORGEN's Strategy Week, Kuala Lumpur, March 2017 - Credit: APAFRI

# What is the Global Plan of Action on Forest Genetic Resources?

The **Global Plan of Action on 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**, 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 on FGR was agreed on by the FAO Commission on Genetic Resources for Food and Agriculture in its 14<sup>th</sup> session in January 2013, and subsequently adopted by FAO Conference in its 38<sup>th</sup> session in June 2013. The Commission of Forestry, the highest FAO Forestry statutory body, recommended the implementation of the Global Plan of Action on FGR in its 22th session in June 2014.

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 can 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.

Implementation of the Global Plan of Action will strengthen the sustainability of FGR while contributing towards the Aichi Biodiversity Targets and the Sustainable Development Goals.

The Commission on Genetic Resources for Food and Agriculture, in its 14<sup>th</sup> session, requested FAO to develop an implementation strategy for the Global Plan of Action on FGR, and encouraged the mobilization of adequate financial resources, preferably from voluntary contributions, particularly to support developing countries in the implementation of the Global Plan of Action.

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

Managing and conserving forest genetic resources are cross-cutting issues, relevant to all fields of forestry. This should make it easy to integrate them in different aspects of forest conservation and management. Ironically, the opposite is often true. In Europe, one of the member countries of the regional forest genetic resources network EUFORGEN formulated a National Strategy for forest genetic resources already in the early 2000s. However, it took ten years to have it integrated in the National Forest Programme, due to resistance from multiple stakeholder groups. When forest owners heard the word 'conservation', they objected; when environmental organizations heard the word 'genetics', they thought of tree breeding and objected. Most people are not aware of the importance of genetic resources for their own activities, and so they tend to focus on what they don't like about the term, instead of thinking what it has to offer to them and how it could help improve yields, conservation planning, carbon sequestration, livelihoods, pest resistance and so on. I hope that through APFORGEN's efforts, we will be able to turn the tide in Asia-Pacific countries.

Jarkko Koskela, FAO Forestry Officer, Forest Genetic Resources

# **APFORGEN'S OBJECTIVES 2018-2022**

In a meeting of its National Coordinators in March 2017, APFORGEN identified four objectives for regional collaboration to support the implementation of the Global Plan of Action on Forest Genetic Resources for the years 2018-2022.

# 1. Mobilize political and financial support for the implementation of the Global Plan of Action on Forest Genetic Resources in the Asia-Pacific Region

Although FGR in many Asian countries have been severely depleted, there is limited recognition about their crucial ecological and societal importance, including for timber production, forest and landscape restoration and adaptation to and mitigation of climate change. Political and institutional support for conserving the resource base have not kept pace with the economic development in the region. National forest- or biodiversity- related strategies and action plans typically lack mention of genetic conservation measures for tree species. Forest managers 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 conservation and sustainable use of tree species, increases genetic risks in subsequent generations and limits adaptation to climate change. These challenges highlight the need for strengthening efforts to raise awareness about the contribution of forest genetic resources to societies, and to share knowledge, experiences, and good practices in their conservation and sustainable use.

This objective has the following targets:

- Forest genetic resources are incorporated into relevant national and regional planning and implementation processes regarding sustainable forest management, ecosystem restoration and conservation
- Funding is secured to sustain APFORGEN through projects that address the strategic priorities of the Global Plan of Action
- At least 150 forest genetic resources professionals trained by the Regional FGR Training Centre by 2022.

The work under this objective contributes, in particular, to the following Strategic Priorities of the Global Plan of Action on FGR:

- 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 19)
- Establish and strengthen educational and research capacities on FGR to ensure adequate technical support to related development programs (Strategic Priority 21)
- Reinforce regional and international cooperation to support education, knowledge dissemination, research, and conservation and sustainable management of FGR (Strategic Priority 24)
- Strengthen efforts to mobilize the necessary resources, including financing, for the conservation, sustainable use and development of FGR (Strategic Priority 27)

2. Make available information about the forest genetic resources in the Asia-Pacific region

Development of effective conservation strategies for tree genetic diversity starts with understanding the species' natural distribution. Unfortunately, even this basic knowledge is largely incomplete for tropical tree species. At the same time, it is ideally suited for regional collaboration, given that the distribution ranges of many socio-economically important species span several countries. Up-to-date estimates of species distribution will provide the necessary basis for studies on genetic diversity and its distribution, assessing climate change impacts on tree species, and designing networks of gene conservation units and seed production areas to support tree planting and restoration efforts.

This objective has the following targets:

- Natural distribution maps compiled for 50 priority tree species native to the Asia-Pacific region
- Seed sources and patterns of genetic diversity documented for 10 priority tree species

The work under this objective contributes, in particular, to the following Strategic Priorities of the Global Plan of Action on FGR:

- Promote the establishment and the reinforcement of FGR information systems (databases) to cover available scientific and traditional knowledge on uses, distribution, habitats, biology and genetic variation of species and species populations (Strategic Priority 4)
- Identify priority species for action (Strategic Priority 10)



Photo: Participants working on a case study at the Regional Training Course on forest genetic resources, Binzhou, China, October 2017 – Credit: China Happy Ecology Ltd.

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

Tree genera of *Dalbergia* (Rosewood), *Shorea* (Dipterocarp family) and *Tectona* (Teak), all native to Asia, include many highly valuable tree species. They are important for timber production and other ecosystem services, especially as terrestrial carbon sinks. Some species such as *Shorea stenoptera*, *S. macrophylla and S. robusta* also serve as sources of non-timber forest products (resins and oil production from seed) and generate income for local communities. However, because of their high economic value, growing demand for timber and agricultural land, these species are threatened by overexploitation, illegal logging and habitat conversion. Their conservation status is further hampered by unsustainable seed collection practices, limited natural regeneration and limited interest to establish plantations for commercial purposes (with the exception of Teak) because of slow growth rates. As the commercially most desired species are fast depleting, pressure is shifting on a widening group of related species.

Recognizing these threats, the Convention on International Trade on Endangered Species (CITES) in 2016 placed trade restrictions on the entire genus of *Dalbergia*. Endangered *Shorea* species on *the* IUCN Red List of Threatened Species include, among many others, *S. leprosula*, *S. lamellata*, *S. lumutensis*, *S. hemsleyana* 



Photo: Seed production area for Siamese Rosewood (*Dalbergia cochinchinensis*), Thailand – Credit: S. Tangmitcharoen



Photo: Collecting samples for genetic studies – Credit: R. Jalonen

*ssp. hemsleyana, S. peltata, S. roxburghii, S.stenoptera and S. teysmanniana.* Yet, the actual conservation status of many of the species is uncertain at the lack of up-to-date information on their distribution and population status.

There is an urgent need for concerted efforts to conserve these species and their genetic diversity and to develop strategies for their sustainable use across their distribution range, to contribute to local, national and regional economies. There are existing models for conserving and sustainably using the tree genetic resources through involving local communities and contributing to their livelihoods, and such models could be adapted to other species and countries in the region. This Objective has the following targets:

- Genetic diversity and phylogeography of *Dalbergia spp.* and *Shorea spp.* is assessed
- Conservation strategies and germplasm collection guidelines established for selected *Dalbergia spp.* and *Shorea spp.*
- Germplasm of *Dalbergia spp*. is collected in each country within their distribution range to support their conservation in situ and ex situ, tree breeding and sustainable use in the region
- Regional species and provenance trials are established for *Dalbergia spp.* and *Shorea spp.* for gene conservation and tree breeding purposes
- Regional networking and partnerships related to conservation, management and sustainable use of common priority species are enhanced (including but not restricted to *Dalbergia* and *Shorea spp.* and Teak)

The work under this objective contributes, in particular, to the following Strategic Priorities of the *Global Plan of Action*:

- Establish and strengthen national FGR assessment, characterization and monitoring systems (Strategic Priority 1)
- Promote the establishment and development of efficient and sustainable ex situ conservation systems, including in vivo collections and genebanks (Strategic Priority 6)
- Develop and implement regional in situ conservation strategies and promote ecoregional networking and collaboration) (Strategic Priority 11)

# 4. Strengthen tree seed supply 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. Close to 5 million hectares were planted annually to trees between 2000 and 2010, according to the *Global Forest Resources Assessment of FAO*. Many countries in the Asia-Pacific region have established large-scale national tree planting and restoration programmes with the aim of restoring and reforesting millions of hectares of land, such as the Great Green Wall of China, the Green Mission of India and the National Greening Programme of the Philippines.

Such programmes require enormous amounts of quality tree seed and seedlings,

especially of native tree species which are usually preferred for ecosystem restoration. Using planting material of appropriate origin is also crucial for adaptation to climate change and for enabling subsequent mitigation through sustained biomass growth.

However, there is widespread lack of awareness about the importance of genetically diverse, quality seed, and lack of documented seed sources. Lack of, or poorly enforced, regulations on forest reproductive material have in many cases resulted in mass production of seedlings of unknown origin and quality, often with narrow genetic base, and in their uncontrolled transfer within and across national borders. The potential of natural regeneration as a restoration method is not fully recognised, however, it, too, depends on the availability of adequately diverse seed sources.



Photo: Seed tree of wild nutmeg (*Myristica malabarica*) conserved through a community initiative, Western Ghats, India – Credit: LIFE Trust



Photo: Borneo Ironwood (*Eusideroxylon zwageri*) grows in a nursery – Credit: R. Jalonen

Discontinued government and donor support for national tree seed supply systems and the prevalence of tree farms by small-holders in the region justify the development of market- or demand-driven decentralized seed supply systems. Decentralized seed supply systems can both help meet the demand for seed and provide income for local communities, and there are already promising models in the region that could be tested and adapted in other countries. This objective has the following targets:

- Tools for selecting genetically diverse seed for forest and landscape restoration in changing environments
- Tools to identify priority areas and limitations of natural regeneration as a restoration approach
- Guidelines for identifying and developing effective seed supply systems
- Policy recommendations for scaling up successful restoration models

The work under this objective contributes, in particular, to the following Strategic Priorities of the Global Plan of Action:

- Develop and reinforce national seed programmes to ensure the availability of genetically appropriate tree seeds in the quantities and of the (certified) quality needed for national plantation programmes (Strategic Priority 12)
- Promote restoration and rehabilitation of ecosystems using genetically appropriate material (Strategic Priority 13)
- Promote the participation of indigenous and local communities in FGR management in the context of decentralization (Strategic Priority 22)

# **Message from APAFRI Chair**

The Asia Pacific Association of Forestry Research Institutions (APAFRI) is an independent non-profit body, which aims to enhance research and technology development capabilities in support of conservation and management of forest resources in the Asia-Pacific region. APAFRI provides a viable institutional framework for research collaboration in the region, including collaboration in FGR among APFORGEN member countries. As one of the founding members of APFORGEN, APAFRI also hosted the Secretariat of APFORGEN for many years before the establishment of a formal structure and the election of Chair, Vice Chairs and Secretary in 2017. APAFRI actively participated in and co-organized many APFORGEN and contribute to the strengthening of APFORGEN in future.



#### Park Jung-Hwan, Chair of the Executive Committee, APAFRI

# **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 organisation. Bioversity International, a CGIAR research centre, provides technical support to APFORGEN. APFORGEN also collaborates with Asia Pacific Association of Forestry Research Institutions (APAFRI) and Food and Agriculture Organization of the United Nations (FAO).

At the time of the development of this strategy, APFORGEN is chaired by Professor Zheng Yongqi from the Chinese Academy of Forestry (2017-2019).

Forestry authorities, national and regional research organisations in Asia and the Pacific may apply to join APFORGEN to benefit from the network's activities.

# **IMPLEMENTATION**

APFORGEN's four strategic objectives are in line with the *Strategy for the Implementation of the Global Plan of Action on Forest Genetic Resources* <sup>4</sup>, which foresees action in, among other issues, advocacy and international awareness, development and support of relevant global and regional networks, and supporting countries in the development of national and regional strategies and in securing adequate and sustainable funding for the implementation of the Global Plan of Action on FGR.

APFORGEN has established four Working Groups to implement the objectives of the Strategy. Membership of the Working Groups is open to interested parties. More information about the Working Groups is available from <u>www.apforgen.org</u> To support the effective implementation of the Global Plan of Action on FGR, and to harness the full potential of FGR for the Sustainable Development Goals, APFORGEN seeks to:

• Enhance the integration of conservation and sustainable use of FGR into relevant processes and programmes, from local to national and regional levels. This will not only help to conserve FGR, but also to implement the wider land use 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



Photo: Second Regional Training Course on forest genetic resources, Binzhou, China – Credit: China Happy Ecology Ltd.

<sup>&</sup>lt;sup>4</sup> Adopted by the Commission on Genetic Resources for Food and Agriculture at its 15<sup>th</sup> session in January 2015. Available from <u>http://www.fao.org/3/a-mm660e.pdf</u> (Annex E).

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 to pool expertise, share good practices, build on synergies and raise the visibility of FGR.
- Strengthen human capacities through the Asia Pacific Regional Training Centre on Forest Genetic Resources, development of training materials, and mentoring and scientific exchange programmes, to cultivate the next generation of experts in FGR conservation and management in Asia and the Pacific
- Mobilize resources for implementing this programme of work, including through regional research and development

projects. At the same time, sustained commitments that help transform FGR research and management from projectbased towards programme-based approaches will be particularly helpful. Contributions of core funding to support strategic planning, communication, and policy dialogue will also be valuable to sustain the regional network.

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



Photo: Workshop on regional project development, Kuala Lumpur, March 2017 - Credit: APAFRI

#### Acknowledgements

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