



# Forest genetic resources conservation and management

Proceedings of the Asia Pacific Forest Genetic Resources  
Programme (APFORGEN) Inception Workshop,  
Kepong, Kuala Lumpur, Malaysia, 15–18 July, 2003

**T. Luoma-aho, L.T. Hong, V. Ramanatha Rao and  
H.C. Sim, editors**



FUTURE  
HARVEST  
<[www.futureharvest.org](http://www.futureharvest.org)>

IPGRI is  
a Future Harvest Centre  
supported by the  
Consultative Group on  
International Agricultural  
Research (CGIAR)



**The International Plant Genetic Resources Institute (IPGRI)** is an independent international scientific organization that seeks to advance the conservation and use of plant genetic diversity for the well-being of present and future generations. It is one of 16 Future Harvest Centres supported by the Consultative Group on International Agricultural Research (CGIAR), an association of public and private members who support efforts to mobilize cutting-edge science to reduce hunger and poverty, improve human nutrition and health, and protect the environment. IPGRI has its headquarters in Maccarese, near Rome, Italy, with offices in more than 20 other countries worldwide. The Institute operates through three programmes: (1) the Plant Genetic Resources Programme, (2) the CGIAR Genetic Resources Support Programme and (3) the International Network for the Improvement of Banana and Plantain (INIBAP).

The international status of IPGRI is conferred under an Establishment Agreement which, by January 2003, had been signed by the Governments of Algeria, Australia, Belgium, Benin, Bolivia, Brazil, Burkina Faso, Cameroon, Chile, China, Congo, Costa Rica, Côte d'Ivoire, Cyprus, Czech Republic, Denmark, Ecuador, Egypt, Greece, Guinea, Hungary, India, Indonesia, Iran, Israel, Italy, Jordan, Kenya, Malaysia, Mauritania, Morocco, Norway, Pakistan, Panama, Peru, Poland, Portugal, Romania, Russia, Senegal, Slovakia, Sudan, Switzerland, Syria, Tunisia, Turkey, Uganda and Ukraine.

Financial support for IPGRI's research is provided by more than 150 donors, including governments, private foundations and international organizations. For details of donors and research activities please see IPGRI's Annual Reports, which are available in printed form on request from [ipgri-publications@cgiar.org](mailto:ipgri-publications@cgiar.org) or from IPGRI's Web site ([www.ipgri.cgiar.org](http://www.ipgri.cgiar.org)).

The geographical designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of IPGRI or the CGIAR concerning the legal status of any country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries. Similarly, the views expressed are those of the authors and do not necessarily reflect the views of these organizations.

Mention of a proprietary name does not constitute endorsement of the product and is given only for information.

**Citation:** Luoma-aho, T., L.T. Hong, V. Ramanatha Rao and H.C. Sim, editors. 2004. Forest genetic resources conservation and management. Proceedings of the Asia Pacific Forest Genetic Resources Programme (APFORGEN) Inception Workshop, Kepong, Malaysia, 15-18 July, 2003. IPGRI-APO, Serdang, Malaysia.

#### **Front Cover:**

(left from top)

- 1) Flower buds of *Shorea lumutensis*, a rare dipterocarp endemic to Peninsular Malaysia. Photo © S.L. Lee/FRIM.
- 2) Fruits of *Dipterocarpus intricatus*. Photo © J. Koskela/IPGRI.
- 3) Experimental tree nursery in Vietnam. Photo © T. Luoma-aho/IPGRI.

(right from top)

- 1) *Shorea* sp. in Meliau Basin, Sabah, Malaysia. Photo © K.M. Wong /Universiti Malaya.
- 2) *Ex situ* conservation of rare dipterocarps in Vietnam. Photo © T. Luoma-aho/IPGRI.

#### **Back Cover:**

Crown of *Tristaniaopsis whitiana* in Nenasi FR, Peninsular Malaysia. Photo © K.M. Wong /Universiti Malaya.

Pods of *Parkia speciosa* are commonly used for food in Southeast Asia. Photo © P. Quek/IPGRI.

Wildlife in Taman Negara National Park, Malaysia. Photo © James Tan.

Signboard. Photo © T. Luoma-aho/IPGRI.

ISBN 92-9043-624-7

IPGRI

Regional Office for Asia, the Pacific and Oceania

PO Box 236, UPM Post Office,

43400 Serdang, Selangor Darul Ehsan, MALAYSIA

© International Plant Genetic Resources Institute, 2004



**The Asia Pacific Association of Forestry Research Institutions (APAFRI)** is an Association of Institutions with an active interest in forestry research, conservation, management and other forestry related matters in the Asia Pacific. Its objective is to promote collaboration among institutions to enhance and increase the forestry research and conservation capacity in the Asia Pacific.

The establishment of APAFRI was prompted by the need to provide a viable institutional framework for research collaboration in the region. Since 1991, the Forestry Research Support Programme for Asia and the Pacific (FORSPA) has been fulfilling the networking function.

Countries in the region and the donor community wish to develop a more self-reliant, sustainable and participatory institutional mechanism as a logical follow-up of FORSPA. The feasibility of establishment of an Association was discussed in the FORSPA Pre-implementation seminar held at Kuala Lumpur in January 1992. A draft constitution was prepared and circulated and subsequently a drafting committee prepared a revision. This was discussed, modified and adopted during the meeting of the Heads of Forestry Research Organizations in the Asia Pacific in Bogor on 21 February 1995, and resulted in the establishment of APAFRI.

The International Union of Forest Research Organizations (IUFRO) has recognised APAFRI as its Asia Pacific chapter. APAFRI has been collaborating closely with the IUFRO Special Programme for Developing Countries (SPDC) in strengthening research in the Asia Pacific region. Extending from that, APAFRI's Executive Director has recently been appointed as the Asia Pacific Regional Coordinator of IUFRO SPDC. APAFRI has also been tasked to coordinate the development of an Asian component in IUFRO's Global Forest Information Service (GFIS).

APAFRI  
c/o Forest Research Institute Malaysia,  
Kepong, 52109 Kuala Lumpur, Malaysia



## Contents

<b>Foreword</b>	vii
<b>Preface</b>	viii
<b>Acronyms</b>	ix

### Summary of the APFORGEN Inception Workshop<sup>1</sup>

#### Background document

Asia Pacific Forest Genetic Resources Programme (APFORGEN) The way to the Inception Workshop, Kuala Lumpur, 15–18 July 2003 <i>Jarkko Koskela, L.T. Hong and V. Ramanatha Rao</i>	8
---	---

#### Country Reports

Status of forest genetic resources conservation and management in Bangladesh <i>Sk. Sirajul Islam</i>	27
Status of forest genetic resources conservation and management in India <i>R.P.S. Katwal, R.K. Srivastava, S. Kumar and V. Jeeva</i>	49
Status of forest genetic resources conservation and management in Nepal <i>P.R. Tamrakar</i>	78
Status of forest genetic resources conservation and management in Pakistan <i>Shams R. Khan</i>	100
Status of forest genetic resources conservation and management in Sri Lanka <i>J.E. Munasinghe</i>	116
Status of forest genetic resources conservation and management in the People's Republic of China <i>Huoran Wang</i>	134
Status of forest genetic resources conservation and management in Cambodia <i>So Thea</i>	150
Status of forest genetic resources conservation and management in Indonesia <i>Nur Masripatin, Anto Rimbawanto, Anthonius YPBC Widyatmoko, Didik Purwito, Muji Susanto, Noor Khomsah, Yuliah, Teguh Setiadji and Lukman Hakim</i>	164
Status of forest genetic resources conservation and management in Lao PDR <i>Chansamone Phongoudome and Khamphone Mounlamai</i>	183
Status of forest genetic resources conservation and management in Malaysia <i>S.L. Lee and B. Krishnapillay</i>	206
Status of forest genetic resources conservation and management in the Philippines <i>R.A. Razal, E.L. Tolentino, Jr., M.U. Garcia, E.S. Fernando, N.T. Baguionon, M.O. Quimado, L.A. Donoso and A.C. Luna</i>	229

Status of forest genetic resources conservation and management in Thailand <i>Vichien Sumantakul</i>	265
Status of forest genetic resources conservation and management in Vietnam <i>Nguyen Hoang Nghia</i>	290
<b>Invited papers</b>	
The potential for using molecular markers to facilitate gene management and the <i>in situ</i> and <i>ex situ</i> conservation of tropical forest trees <i>Suchitra Changtragoon</i>	305
The role of <i>ex situ</i> conservation of trees in living stands <i>Ida Theilade</i>	316
<b>Annex I</b> 326	
Reports of the sub-regional working groups	
<b>Annex II</b> 332	
Workshop programme	
<b>Annex III</b> 335	
List of Workshop Participants	
<b>Annex IV</b> 338	
Group photo	

## Foreword

Conservation, improvement, and effective management of forest genetic resources (FGR) is basic to sustainable forest management but will require a holistic approach at various hierarchical levels (ecosystem, landscape, national and regional). While the concern of governments in managing their FGR has been increasing with the increasing introduction of relevant national policies and guidelines, there is a need for better collaboration at regional level despite the efforts already expanded by international and regional organizations. The FAO Panel of Experts on FGR has played a major role in providing recommendations at the global level and has stressed the need to strengthen national programmes and regional collaboration on FGR in different parts of the world.

Several countries in the Asia Pacific region have taken steps to implement sustainable forest management in practice and there is a need to promote management of FGR within this process. Better management of forest genetic diversity will also help countries to fulfil their commitments as agreed under the Convention on Biological Diversity and to maintain diversity for future use. Responding to this need and following-up on the recommendations of the Southeast Asian Workshop of FGR held in Thailand in 2001, the International Plant Genetic Resources Institute (IPGRI) in collaboration with the Asia Pacific Association of Forestry Research Institutions (APAFRI) have taken the initiative to develop a regional network programme to strengthen the work on conservation and sustainable use of FGR in the region. This regional programme, called the Asia Pacific Forest Genetic Resources Programme (APFORGEN) has the support of fourteen countries in the region. The establishment of APFORGEN will greatly assist national programmes on FGR to be better coordinated and implemented and will also foster closer collaboration in the exchange of information, knowledge and expertise of FGR conservation and management in the region.

The Inception workshop, organized with the technical cooperation of FAO has laid the foundation for initiating FGR networking in the region via APFORGEN. The participation of twelve country representatives in the inception workshop is an indication of support of national governments, which desire closer collaboration in FGR conservation and management.

**Dr Percy E. Sajise**  
Regional Director,  
IPGRI-APO

**Dato' Dr Abdul Razak Mohd Ali**  
Chairman,  
APAFRI

## Preface

The APFORGEN Inception Workshop was organized at an appropriate time noting the concerns and the urgent needs for conservation and sustainable management of forest genetic resources in facing the fast pace of development in the Asia Pacific region (APO). The workshop conducted at the Forest Research Institute Malaysia, Kepong, Malaysia enabled the participating countries to present the status of forest genetic resources (FGR) conservation and management in their countries. The representatives from the 12 countries that were present had the opportunity to interact with each other and also with the FAO representative and the two Danida Forest Seed Centre (DFSC) representatives who also participated in the workshop.

In addition to documenting the status of national FGR conservation and management activities, the 4-day programme enabled the framework for the operation of APFORGEN to be drawn up and also identified concept notes on various FGR-related topics to be developed for potential funding support. The workshop identified a list of priority species for the region to be used as a guide for collaborative R&D in FGR, bearing in mind the limited trained human resources for FGR work in the region. Another area that needs attention is improving the flow and accessibility of FGR information in the region. The participants have endorsed the setting up of the APFORGEN website to improve the situation, in addition to other ways of communication.

It is hoped that this proceeding could serve as one reference and information base for FGR conservation and management in the region, in which closer collaboration could be fostered and improved.

Organizing this workshop would not have been successful without the assistance of various individuals and organizations. We thank them all. The Food and Agriculture Organisation of the United Nations (FAO) / Forestry Research Support Programme for Asia and the Pacific (FORSPA) provided technical support for the workshop; especially we want to thank Pierre Sigaud at FAO, Rome and Dr Simmathiri Appanah (FORSPA), Bangkok. Furthermore, we would like to thank Dr Jarkko Koskela (IPGRI), who has been instrumental in developing the concept of APFORGEN and Dr Weber Amaral (IPGRI) who has been supportive of FGR activities in the region as well as Dr Anders P. Pedersen and Dr Ida Theilade at the DFSC. Finally, thank you to Dato' Dr Mohd Abdul Razak and the FRIM for providing a nice setting for the workshop as well as helping in the practical arrangements.

In addition, we want to thank all those who have been supporting the development of APFORGEN during the past year, for example the organisers of the previous Southeast Asian FGR workshop in Thailand 2001 as well as all the participants of this workshop. We look forward to increased regional collaboration in conservation and sustainable management of the invaluable forest genetic resources in the region.

**T. Luoma-aho**, Associate Scientist (Forest Genetic Resources), IPGRI-APO

**L.T. Hong**, Bamboo, Rattan and FGR Specialist, IPGRI-APO

**V. Ramanatha Rao**, Senior Scientist (Genetic Diversity), IPGRI-APO

**H.C. Sim**, Executive Director, APAFRI