

**REPORT**

Rome,  
Italy,  
29 September-  
1 October 1999

# **FAO Panel of Experts on Forest Gene Resources**

## **Eleventh session**



Food  
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Agriculture  
Organization  
of  
the  
United  
Nations

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**Report of the Eleventh Session of the  
FAO PANEL OF EXPERTS ON FOREST GENE RESOURCES**

**Rome, Italy**

**29 September-1 October 1999**

**including Forest Genetic Resources Priorities**

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ACRONYMS<sup>1</sup>

CBD	Convention on Biological Diversity (Canada)
CGIAR	Consultative Group on International Agricultural Research (USA)
CIFOR	Centre for International Forestry Research of the CGIAR (Indonesia)
CIRAD-Forêt	Centre de Coopération Internationale en Recherche Agronomique pour le Développement (France)
CSIRO	Commonwealth Scientific and Industrial Research Organization(Australia)
DFSC	DANIDA Forest Seed Centre (Denmark)
FAO	Food and Agriculture Organization of the United Nations (Italy)
IPGRI	International Plant Genetic Resources Institute of the CGIAR (Italy)
ICRAF	International Centre for Research in Agroforestry of the CGIAR (Kenya)
IPF	Inter-Governmental Panel on Forests (USA)
IUCN	World Conservation Union (Switzerland)
IUFRO	International Union of Forestry Research Organizations (Austria)
UNCED	United Nations Conference on Environment and Development (Rio de Janeiro, Brazil 3-14 June 1992)
UNDP	United Nations Development Programme (USA)
UNEP	United Nations Environment Programme (Kenya)
UNESCO	United Nations Educational, Scientific and Cultural Organization(France)
WCMC	World Conservation Monitoring Centre (UK)
WWF	World Wide Fund for Nature (Switzerland)

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<sup>1</sup> Location of headquarters is given in brackets.

## FAO PANEL OF EXPERTS ON FOREST GENE RESOURCES

### REPORT OF THE ELEVENTH SESSION

Rome, Italy 29 September – 1 October 1999

#### I. INTRODUCTION

The FAO Panel of Experts on Forest Gene Resources was established in accordance with the directives of the Fourteenth Session of the FAO Conference (November 1967), which read as follows:

"244. Forest Tree Genetic Resources. The Conference requested the Director-General to take into account Recommendation N° 62 of document C67/AG/FO/1 in formulating the Programme of Work and Budget 1970-71. It recognized that, as development proceeds in the less as well as in the more advanced areas of the world, the reserves of genetic variation stored in the natural forests have been or are being displaced on an increasing scale. Moreover, efforts to explore and collect forest genetic resources were, on a world scale, inadequate and inadequately concerted.

245. The Conference requested the Director-General to establish a Panel of Experts on Forest Gene Resources to help plan and coordinate FAO's efforts to explore, utilize and conserve the gene resources of forest trees and, in particular, help prepare a detailed short-term programme and draft long-term programme for FAO's action in this field and to provide information to Member Governments."

The Director-General established the Panel in 1968. A list of current members of the Panel is shown in Appendix 1.

The Panel held Sessions as follows:

<b>Session N°</b>	<b>Date</b>	<b>Place</b>	<b>Year of Report</b>
1	October 1968	Rome, Italy	1969
2	March 1971	Macon, Georgia, USA	1972
3	May 1974	Rome, Italy	1974
4	March 1977	Canberra, Australia	1977
5	December 1981	Rome, Italy	1984
6	December 1985	Rome, Italy	1988
7	December 1989	Rome, Italy	1990
8	June 1993	Rome, Italy	1994
9	October 1995	Rome, Italy	1996
10	September 1997	Rome, Italy	1998

The Eleventh Session of the Panel was held at FAO Headquarters, Rome, Italy from 29 September to 1 October 1999.

Members attending the Eleventh Session of the FAO Panel of Experts on Forest Gene Resources were:

**1. Panel members**

Mr. S.J. Midgley	Australia
Dr. P.Y. Kageyama	Brazil
M. A. Issa	Burkina Faso
Mr. Wang Houran	China
Sr. F. Mesén	Costa Rica
Dr. B.A. Ditlevsen	Denmark
Dr. V. Koski	Finland
Dr. H.I. Joly	France
Prof. R. Morandini	Italy
Dr. D. Baskaran K.	Malaysia
Sr. F. Patiño V.	Mexico
Dr. R.D. Barnes	United Kingdom
Dr. G. Namkoong	United States of America
Mr. D.P. Gwaze	Zimbabwe

**2. Resource person**

Mr. M.K. Sharma	India
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**3. Observers from International Agencies**

Mr. I. Dawson	ICRAF
Mr. A. Ouedraogo	IPGRI/IUFRO
Mr. J. Turok	IPGRI

**4. Secretariat**

Ms. C. Palmberg-Lerche	FAO, Forest Resources Development Service
Mr. P. Sigaud	FAO, Forest Resources Development Service
Mr. S. Hald	FAO, Forest Resources Development Service

Mr. D.A. Harcharik, Deputy Director-General, Mr. M. Hosny El-Lakany, Assistant Director-General, Forestry Department, and Mr. J.C. Clément, Director, Forest Resources Division, attended parts of the Session, further joined occasionally by colleagues from the Agriculture and Sustainable Development Departments.

The Panel unanimously re-elected Mr. Fernando Patiño Valera of Mexico Chairman, and Dr. Stephen Midgley of Australia Vice-Chairman. The Agenda adopted is shown in [Appendix 2](#).

A list of Secretariat Notes discussed by the Panel is given in [Appendix 3](#). In addition, each Panel member made a brief presentation and submitted information on the region or sub-region covered by him or her. Observers also made brief statements. Such information usefully supplemented the information provided in the Secretariat Notes on the present state of forest genetic resources in the world, programmes, priorities and desirable action. A presentation on the Draft Strategic Framework for FAO, presented by the DDG, helped place the discussion into the overall context of FAO's work in support of priorities of Member Nations.



## II. DISCUSSIONS

Panel Members reported on forest genetic resources activities which had taken place in countries in the various regions covered by each of them since the previous session of the Panel (September 1997). The expansion in technical coverage, the increase in number of institutes and agencies involved, and new developments at the policy, institutional and scientific/technical levels and their implications for the forest genetic resources work of FAO, were discussed.

The Panel reviewed global developments and the work of FAO in the light of Secretariat Notes FORGEN/99/3 to FORGEN/99/8<sup>2</sup>. The Panel recognized the compliance with its previous recommendations regarding general focus of FAO's forest genetic resources activities (Secretariat Note FORGEN/99/3). Efforts to use scarce resources efficiently, share information and experience, and avoid duplication of activities among organizations and institutions, were noted.

The Panel recognized FAO's international leadership role and its important function in advising and collaborating with national institutes in *in situ* and *ex situ* conservation, and enhancement and sustainable utilization of forest genetic resources. The Panel stressed the importance of maintaining collaboration and forging partnerships with the growing number of national and international agencies and actors in the forest genetic resources field, building on common trust and professional esteem, in addition to formal relationships.

Emphasizing that FAO's work in forestry was a comprehensive effort comprising both normative and operational functions, the Panel stressed the importance of the Field Programme, and the need to make full use of the opportunities for collaboration between technical work at FAO Headquarters and that undertaken in the field, and in the regional and sub-regional offices.

The Panel took note of the debate which had taken place in other international fora, notably within the framework of the Commission on Genetic Resources for Food and Agriculture, the Convention on Biological Diversity and the World Trade Organization, with regard to intellectual property rights, access to and trade in genetic resources, the use of genetically modified organisms, and biosafety. It welcomed FAO's inter-Departmental activities on the use of biotechnologies, and discussed the place and role of these new tools which could have considerable potential, provided that due attention and resources were allocated to conservation and breeding work underpinning their use.

The Panel noted action taken by FAO, in collaboration with other national, regional and international agencies, in follow-up to the recommendations of the Thirteenth Session of the Committee on Forestry and the recommendations of the Tenth Session of the Panel of Experts on Forest Gene Resources, related to support to countries in the organization of country-driven and action-oriented workshops on the management of forest genetic resources (incl. their conservation, enhancement and sustainable utilization). The Panel reviewed the outcome of the first two workshops (dry-zone sub-Saharan Africa, Sept 1998; the South Pacific, March 1999), and noted that the next workshop would be held in Southern and Eastern Africa. Panel members transmitted to FAO the wish of countries in Northern and Eastern Asia, and Central America, to receive assistance in the organization of similar workshops in the coming future. Panel members covering Central America and South Asia reported on regional and sub-regional forest genetic resources initiatives in those regions.

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<sup>2</sup> Secretariat Notes have been placed on the forest genetic resources homepage:  
<http://www.fao.org/forestry/FOR/FORM/FOGENRES/homepage/secnotes.stm>

The importance of continued FAO assistance in the elaboration of dynamic regional/sub-regional status and action plans, based on priorities and needs identified by countries concerned, and discussed and agreed upon in regional forest genetic resources workshops, was considered of paramount importance, with a view to develop, in the coming future, a country-driven, participatory global action framework for the conservation and sustainable utilization of forest genetic resources. Panel members offered their support in planning, execution and follow-up to the workshops, as required.

The Panel noted that the IUFRO Task Force on Management and Conservation of Forest Genetic Resources, established following discussions at the 10<sup>th</sup> Session of the Panel, had met at FAO Headquarters during the days preceding the Panel meeting. Issues discussed included the contribution of the Task Force to the preparation of the XXI IUFRO World Congress 2000.

The Panel up-dated the lists of priority species by region and by operational activity, regularly prepared at its Sessions, drawing on information and expertise in the regions and sub-regions covered by each Panel Member. It was noted that the Panel lists complemented, and built upon, national and local lists of priority species; they also complemented sub-sectoral lists and lists of e.g. endangered forest tree species, elaborated by other agencies and organizations. The Panel drew attention to a limited number of specific species and genera in which it recommended that FAO help strengthen on-going and planned international and national level activities of importance to a range of countries. These included mahoganies and neem.

### III. RECOMMENDATIONS

#### Recommendations at Policy Level

1. The Panel stressed the need for FAO to continue to work in close partnership with governments and national institutions, international, regional and bilateral organizations, and in collaboration with non-governmental organizations and groups, the private sector, communities and various interest groups and individuals.
2. The Panel emphasized that FAO should remain a point of reference in the forest genetic resources field, and continue to catalyze, support and help coordinate action at international level, thus assisting member countries to conserve and utilize forest and tree genetic resources in a sustainable manner.
3. Balanced attention should continue to be given to activities in the various eco-regional zones and to the full range of forest genetic resources activities. The Panel highlighted the need for continued links and close synergy between FAO's normative work and the field programme, and the need for close collaboration with other technical units in FAO underpinning an interdisciplinary approach.
4. In order to allow activities to continue in line with recommendations by concerned Statutory and Governing Bodies of the Organization which reflected expectations of member nations and the international community, the Panel requested that efforts be made to sustain present levels of resources allocated to FAO's forest genetic resources programme. In the meantime, the Panel encouraged FAO to explore options to broaden partnership with, and use expertise and human resources from, research and academic institutions, to address areas of common interest for mutual benefit.

### Recommendations on Overall Focus

5. Noting the contribution to rural development that work related to forest genetic resources could provide, the Panel stressed the need for FAO to help raise awareness, in relevant national and international forestry and non-forestry fora, of the role and the potential of forest genetic resource activities, thus helping to promote the integration of forest genetic resources considerations into programmes aimed at sustainable resource use.

6. The Panel stressed the need to continue to publicize the social, economic and environmental benefits of conservation and wise utilization of forest genetic resources, and the direct and indirect contributions which such action made to food security and overall development of nations. It stressed the need to further emphasize the compatibility of resource conservation and genetic management with the managed utilization of forest resources, aimed at meeting present-day needs.

7. Noting the Forestry Department's experience in cross-sectoral approaches to major issues, such as food security, sustainable rural development and integrated land use, the Panel highlighted FAO's role in ensuring that full use be made of already existing action frameworks in the implementation of forest genetic resources plans and activities. Such frameworks included national forest programmes and programmes on sustainable forest management; biological diversity action plans; and environmental conservation programmes. The need to further support the incorporation of genetic principles into protected area management plans and forest management practices, was also stressed.

8. The Panel recommended that activities related to the exchange of information, technologies and forest reproductive materials for evaluation and conservation purposes, be continued. Noting new developments in legal aspects related to collection, transfer, exchange and trade in genetic materials, the Panel confirmed the view that such exchange of germplasm should be based on mutually agreed terms and agreements. FAO was encouraged to gather and disseminate relevant information on access, benefit-sharing and biosafety aspects.

9. The Panel stressed the need for FAO to continue the work carried out towards the development of integrated strategies for the management of forest genetic resources (including conservation), with due attention to institutional aspects. At technical level, the Panel stressed the importance of promoting the application of appropriate levels of sophistication of technology, focusing on proven techniques and methods which provided direct impacts with levels of technological sophistication adapted to prevailing institutional settings and financial possibilities. The Panel expressed its support to the further development of methodologies and pilot activities in the *in situ* conservation of forest genetic resources coupled with forest management and sustainable resource utilization.

10. The Panel stressed FAO's important role in raising awareness of the place and role of biotechnologies in tree selection and breeding programmes, in both developed and developing countries, and FAO's role in providing ethical direction and neutral advice and guidance in the use of new technologies. The Panel urged FAO to continue to provide timely up-to-date, neutral and sound information to countries and international organizations on issues related to the use of biotechnologies in forestry, and to serve as "*honest broker of quality science-based information on biotechnologies*"<sup>3</sup>.

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<sup>3</sup> Quotation from FAO Council Document CL 116/Rep. June 1999, para 25.

Recommendations related to Specific Actions and Areas of Activity

The Panel passed a number of specific technical recommendations stressing, in particular, the need for continued and increased attention to:

11. Assistance to the development of species-specific networks, including the International Neem Network, with special reference to the evaluation of provenance trials at international level.
12. Support to national institutions in the development and implementation of forest genetic resources programmes within the framework of regional and sub-regional forest genetic resources workshops and strategies; and assistance in identifying additional support and funding sources for focused activities.
13. Well-targeted information dissemination, and information management, using traditional and new methods. Special mention was made of the annual bulletin "Forest Genetic Resources", and the Forest Genetic Resources Homepage, both available in three languages, as useful vehicles for information dissemination and exchange.
14. Provision of up-to-date information on the state of the world's forest genetic resources, notably through continued development of the FAO World-Wide Information System on Forest Genetic Resources (REFORGEN).
15. The harmonization of concepts and terms, and on-going collaboration with IUFRO for the development of reference glossaries on terms frequently used in the forest genetic resources field; and
16. Assistance to national institutes in carrying out reviews of seed diffusion pathways to identify institutional delivery system gaps, thus helping ensure that a wide range of germplasm users were reached.

**APPENDIX 1**

Membership of the  
Panel of Experts on Forest Gene Resources  
Period 1 July 1997 - 30 June 2000

Composition du  
Groupe d'experts des ressources génétiques forestières  
Période 1<sup>er</sup> juillet 1997 - 30 juin 2000

Composición del  
Cuadro de Expertos en Recursos Genéticos Forestales  
Período 1 de julio de 1997 - 30 de junio de 2000

Australia Australie	Mr. S.J. Midgley Australian Tree Seed Centre CSIRO Division of Forestry and Forest Products P.O. Box E 4008 Kingston, ACT 2605
Brazil Brésil Brasil	Dr. P.Y. Kageyama Escola Superior de Agricultura "Luiz de Queiroz" Depto. de Ciencias Florestais Universidade de São Paulo Caixa Postal No. 9 Piracicaba SP 13418-900
Burkina Faso	M. Aboubacar Issa Secrétariat du CILSS B.P. 7049 Ouagadougou
China Chine	Mr. Wang Huoran Research Institute of Forestry Chinese Academy of Forestry Wan Shou Shan Beijing 100091
Costa Rica	Sr. F. Mesén CATIE P.O. Box 74 Turrialba 7170
Denmark Danemark Dinamarca	Dr. B.A. Ditlevsen DANIDA Forest Seed Centre Krogerupvej 21 DK-3050 Humlebaek

Finland Finlande Finlandia	Dr. V. Koski Forest Research Institute Department of Forest Ecology P.O. Box 18 FIN-01301 Vantaa
France Francia	Dr. H.I. Joly CIRAD-Forêt B.P. 535 F-34032 Montpellier Cedex 01
India Inde	Dr. B.N. Gupta Indian Council of Forestry Research and Education P.O. New Forest Dehra Dun 248006
Italy Italie Italia	Prof. R. Morandini Via Ferruzzi 1 50014 Fiesole
Malaysia la Malaisie Malasia	Dr. D. Baskaran K. Forest Research Institute of Malaysia Kepong 52109 Kuala Lumpur
Mexico Mexique México	Sr. F. Patiño V. Centro de Investigación Regional del Sureste Instituto Nacional de Investigaciones Forestales y Agropecuarias (INIFAP), SAGDER C.E. Zona Henequenera Kilómetro 24 Carretera Mérida-Motúl Mocochá, Yucatán CP 97454
United Kingdom Royaume-Uni Reino Unido	Dr. R. Barnes Oxford Forestry Institute South Parks Road Oxford OX1 3RB
United States of America Etats-Unis d'Amérique Estados Unidos de América	Dr. Gene Namkoong Head, Department of Forest Sciences Faculty of Forestry University of British Columbia MacMillan Building 193-2357 Main Mall Vancouver B.C. V6T 1Z4, Canada
Zimbabwe	Mr. D.P. Gwaze Forest Research Centre P.O. Box HG 595 Highlands, Harare

**APPENDIX 2**

**FAO PANEL OF EXPERTS ON FOREST GENE RESOURCES  
Eleventh Session**

**Rome, Italy 29 September – 1 October 1999  
Mexico Room (D-211)**

**AGENDA**

1. Opening of the Meeting
2. -
3. Adoption of the Agenda
4. Progress since the 10th Session of the Panel (September 1997):
  - (i) Brief statement by individual members (regional/sub-regional issues)
  - (ii) FAO Regular Programme
5. Progress towards the development of regional action plans on forest genetic resources
6. REFORGEN: The FAO world-wide information system on forest genetic resources
7. Discussion of Priorities for Future Action:
  - (i) Species priorities
  - (ii) Priority operations/activities
8. Proposals for FAO Regular Programme Activities:
  - (i) Short-term
  - (ii) Medium and long-term
9. Miscellaneous and Other Business
10. Next Session of the Panel
11. Closing of the Meeting

**APPENDIX 3**

**LIST OF SECRETARIAT NOTES**

<b>AGENDA ITEM</b>	<b>SECR. NOTE N°</b>	<b>TITLE</b>	<b>LANGUAGES</b>
1	FORGEN/99/Inf. 1	List of Secretariat Notes	E,F,S
	FORGEN/99/Inf. 2	List of Documents Distributed	E,F,S
	FORGEN/99/2A	List of Panel Members	Triling.
	FORGEN/99/2B	List of Participants	Triling.
2	-		
3	FORGEN/99/1A	Tentative Agenda	E,F,S
	FORGEN/99/1B	Provisional Timetable	E,F,S
4(i)	-		
4(ii)	FORGEN/99/3	Follow-up to Recommendations of the Tenth Session of the Panel	E,F,S
	FORGEN/99/4A	FAO Regular Programme Activities in Forest Genetic Resources 1998-1999	E,F,S
	FORGEN/99/4B	Financial Contributions in Forest Genetic Resources: non-staff resources. FAO's Regular Programme (RP) (Sub-programme 2412)	E,F,S
5	FORGEN/99/5	Progress towards the development of regional action plans on forest genetic resources	E,F,S
	FORGEN/99/6	FAO/IPGRI/ICRAF Workshop on the Conservation, Management, Sustainable Utilization and Enhancement of Forest Genetic Resources in Dry Zone Sub-Saharan Africa	E,F,S
	FORGEN/99/7	Pacific Sub-regional Workshop on Forest and Tree Genetic Resources	E,F,S
6	FORGEN/99/8	Information Activities	E,F,S
7	-	Appendices 7 and 8: Forest Genetic Resources Priorities (by region, species and operation): 10th Session of the Panel ( <i>for up-dating</i> )	E,F,S
8-11	-		



## **APPENDIX 4**

### **FOLLOW-UP TO RECOMMENDATIONS OF THE TENTH SESSION OF THE PANEL**

This Appendix summarizes the main recommendations addressed to FAO by the Tenth Session of the Panel of Experts on Forest Gene Resources in October 1997 and action taken in response to these recommendations (1997-1999).

#### **I. Introduction**

At its 10<sup>th</sup> Session held in Rome, Italy 9-11 September 1997, the Panel of Experts on Forest Gene Resources passed a total of 25 recommendations. These recommendations, as published in the Report on the meeting, are listed below, accompanied by brief notes on action taken by FAO in response to each of them since the last Session.

The present Secretariat Note should be read in conjunction with Notes FORGEN/99/4, 99/5, 99/6, 99/7 and 99/8.

#### **II. Follow-up to Recommendations**

##### ***THE PANEL:***

**1. Recommended that increased efforts be made to help raise awareness and inform decision makers, the general public, and professionals within and outside the forestry sector, of issues related to the conservation, management, sustainable utilization and enhancement of forest genetic resources, based on sound scientific and technical understanding, and drawing special attention to potential consequences of inaction or neglect.**

Continued high priority has been given to the collection, storage, analysis and dissemination of information, including *i.a.*:

- Development of an Internet Home Page on Forest Genetic Resources <sup>4</sup>;
- Further development of the REFORGEN database and information system;
- Publication of the annual newsbulletin, Forest Genetic Resources, in English (E), French (F) and Spanish (S) (published copy and Internet version);
- Preparation of three Forestry Department Information Notes, in E, F, S (published copy and Internet versions) <sup>5</sup>;
- Inputs on activities in the forest genetic resources field and their links with overall forestry development prepared and published in the biennial FAO documents, *The State of the World's Forests* (SOFO); *The State of Food and Agriculture* (SOFA); and *Agriculture Towards 2015/2030* (in preparation).

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<sup>4</sup> > <http://www.fao.org/forestry/for/form/fogenres/homepage/fogene-e.stm><

<sup>5</sup> Including: (i) Regional Strategies and Action Plans on Forest Genetic Resources; (ii) Management of Forest Genetic Resources: their conservation, enhancement and sustainable utilization; (iii) Panel of Experts on Forest Gene Resources. A number of other Forestry Department Information Notes, found on ><http://www.fao.org/forestry/foda/infonote/infont-e.stm>< are also of relevance to the forest genetic resources field.

- Preparation, publication and dissemination of a number of scientific and technical papers<sup>6</sup>;
- Information has been made available on forest genetic resources activities, with special reference to the regional and sub-regional forest genetic resources workshops underway, and presented at FAO Regional Forestry Commission meetings in all regions (1997-99). The subject received special attention at the 1998 Session of the FAO Regional Commission for Africa.
- Additional details are reported in Note FORGEN/99/8.

**2. Recommended that FAO, in collaboration with relevant Centres of the CGIAR and other interested institutes, continue to play an active role in assisting member countries to carry out exploration, evaluation and domestication of fruit and food bearing forest trees, and help raise awareness of the important, direct role that these species play in food security and rural development.**

- Continued support has been provided to national institutes in the management of genetic resources of tree species prioritized in the countries, including species providing non-wood products such as edible fruits, seeds, leaves and roots (see Annex 2, Note FORGEN/99/5);
- Action has been coordinated with that of the Agriculture Department of FAO in work related to fruit trees; and with Centres of the CGIAR and bilateral donors which support related networking. This includes *i.a.* collaboration with the incipient IPGRI coordinated "Sub-Saharan Forest Genetic Resources Programme" (SAFORGEN), and its planned network on the conservation and sustainable utilization of fruit tree species in the sub-region.

**3. Recommended that FAO continue to provide strong international leadership and a point of reference for the world community in the field of forest genetic resources, in which the competence of the Organization was widely recognized.**

- Continued support has been provided to national institutes and advice has been made available on strategies and methodologies for the wise management of forest genetic resources, including their conservation *in situ* and *ex situ*, enhancement through selection and breeding, and sustainable utilization of the natural renewable resources which provide these resources.
- Assistance has been provided to countries, through national and regional institutes, in the organization of action-oriented workshops on the management of forest genetic resources, with a view to establishing a coherent global framework for action.
- Information, guidance and advice has been provided to the international community, aimed at underpinning policy-level decisions (incl. inputs to the work of the Inter-Governmental Panel and Forum on Forests; the Secretariat of the Convention on Biological Diversity; Centres of the CGIAR; IUFRO; and various international initiatives aimed at the definition and implementation of criteria and indicators for sustainable forest management).

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<sup>6</sup> Including *i.a.*: (i) Palmberg-Lerche, C. (1999) Conservation and Management of Forest Genetic Resources. *Journal of Tropical Forestry Research* 11(1):286-302; (ii) Palmberg-Lerche, C. and Ball, J.B. (1998). Present Status of Forest Plantations in Latin America and the Caribbean and Review of Related Activities in Tree Improvement. First IUFRO/FAO Latin American Congress. Valdivia, Chile 22-28 November 1998; (iii) Sigaud, P. (1998). Development of a coherent global framework for action in the conservation and sustainable utilization of forest genetic resources. FAO/IUFRO All-Division Two Conference on Forest Genetics and Tree Improvement. Beijing, China August 1998.

- Reinforced efforts have been made in the collection, analysis and dissemination of information in the widening field of forest genetic resources, on policy and technical levels; and in the analysis and dissemination of information on genetic management strategies and methodologies (see Recommendation (1) above; and Note FORGEN/99/8).

**4. Recommended that the traditional major focus on collaboration with national institutes and the active promotion of partnerships and networks be maintained, to facilitate transfer of technologies and information, to ensure complementarity of action, and to help avoid wasteful duplication of effort.**

- Work has continued, on traditional lines, with and through national institutes.

**5. Recommended that close cooperation be maintained at international, regional, sub-regional and eco-regional levels between FAO and other international governmental and non-governmental institutes and action frameworks; and that collaboration continue to be fostered for mutual benefit with mechanisms such as the Convention on Biological Diversity and the UN Convention to Combat Desertification.**

- Collaboration has been continued with a range of multilateral UN and non-UN organizations and mechanisms, bilateral agencies and NGOs (notably, in this latter category, Universities, national research institutes, and Centres of the CGIAR).

**6. Requested that efforts be made to sustain present levels of funding for FAO's forest genetic resources programme in order to allow activities to continue in line with recommendations by concerned Statutory and Governing Bodies.**

- While recognizing that total expenditure in 1999 is still an estimate, levels of funding for work related to Regular Programme activities in forest genetic resources in 1998/99 (sub-programme 2412) are expected to remain of the same order of magnitude as those in the previous biennium.
- The level of funding requested and preliminarily programmed for 2000/2001, within a continued, expected overall zero-growth budget of the Organization, also remains relatively stable.
- Details on expenditure are reported in Note FORGEN/99/4B.

**7. Recommended that close linkages, at appropriate levels and using pertinent mechanisms, continue to be maintained between FAO Headquarters, its Regional and Sub-Regional Offices and FAO coordinated field programmes in forest genetic resources, and that the need for close synergy between normative and field activities be adequately reflected in the Forestry Strategy presently under preparation.**

- Advice is provided on a regular basis to Field Projects coordinated by FAO and administered by FAO's Regional and Sub-Regional Offices. Technical Cooperation Projects, and projects with a global scope, are administered and supported directly by FAO Headquarters.
- The Forestry Department Strategy is presently being developed as an integral part of the FAO Strategic Framework.

**8. Recommended that FAO, in collaboration with international and national partners, help promote the development, adoption and implementation of sound forest genetic resources strategies as part of overall, national and regional development plans, with due consideration to the complementarity of conservation, management and enhancement of genetic resources on the one hand, and the management and sustainable utilization of forest resources on the other.**

- Due attention has been given to promoting the incorporation of forest genetic resources aspects into the concept of sustainable forest management; and the inclusion of forest genetic resource considerations in national forests action programmes.

**9. Recommended that a balance be maintained between support to forest genetic resources activities in dry and moist tropical forest ecosystems, and that due attention be given also to Mediterranean, temperate and boreal forests, taking advantage of networking and twinning opportunities, whenever possible.**

- Main focus of attention in 1998/99 was on supporting countries and territories of, (i) the Sahelian zone of Africa; and (ii) the Pacific Islands, in the preparation of sub-regional action plans on forest genetic resources. Similar support will be provided to countries in Southern and Eastern Africa in early 2000.
- Continuing support has been provided to the European Forest Genetic Resources Network, EUFORGEN, coordinated by IPGRI, which includes work in the boreal, temperate and Mediterranean zones of Europe, with links also to work in the Caucasus and Central Asia. Links between EUFORGEN and "Silva Mediterranea" networks, coordinated by FAO, have been vigorously promoted to ensure a circum-Mediterranean approach, where appropriate.
- Support has continued to field projects in all geographical regions, including notably temperate China, tropical countries in the Amazon, and countries in tropical/dry-zone Sahel (e.g. Senegal).

**10. Recommended that FAO and IUFRO, in collaboration with other relevant institutes, review and help revise and update existing terminology in the forest genetic resources field, concentrating initially on a core set of basic terms and concepts.**

- See Annex 4, Note FORGEN/99/4A, regarding on-going work.

**11. Recommended that FAO's Forestry Department continue to keep itself closely informed about developments at national and international levels related to access to plant and forest germplasm, and to inform member countries and collaborating institutes of new developments of relevance to forest genetic resources activities.**

- The work of the Commission on Genetic Resources for Food and Agriculture, and discussions within the framework of the Convention on Biological Diversity in this field, have been closely followed and regularly reported upon to the forest genetic resources community.
- Close contacts have been maintained with developed and developing country institutes active in the field.
- Members of the Panel have been kept informed about action taken i.a. in Australia<sup>7</sup>.
- Relevant action and decisions will continue to be reported upon in the Forest Genetic Resources bulletin.

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<sup>7</sup> Cf. document, "Material Transfer Agreement for Dispatch of Forest Genetic Resources", by CSIRO Division of Forestry and Forest Products (1999).

**12. Recommended that FAO and IPGRI continue to pursue the organization of workshops on the Safe Movement of Forest Germplasm, in close collaboration with other concerned national and international institutes.**

- The FAO/IPGRI Technical Guidelines for the Safe Movement of Pine Germplasm will be finalized and published in 1999, to complement those on Eucalyptus germplasm, already available in E, F, S (IPGRI/FAO 1996).
- FAO and IPGRI, in collaboration with the Forest Research Institute of Malaysia (FRIM), organized in March 1999 a meeting attended by a number of international experts, in which preparations for a planned workshop on the safe movement of Acacia germplasm in the year 2000 were discussed.

**13. Recommended that increased attention be paid to efforts to quantify costs and benefits of genetic conservation and of the management, enhancement and wise utilization of forest genetic resources; and that attention be drawn at policy and decision-making levels to potential risks and economic, social and environmental costs of neglect or mismanagement of these resources, possibly through the elaboration of case studies.**

- Work is being developed in collaboration with the Danida Forest Seed Centre, Denmark, DFSC (contractual services entered into in 1997).
- A number of studies and documents have been published over the past two years with special reference to economics of tree improvement by DFSC; the Australian Centre for International Agricultural Research, ACIAR; CSIRO, Australia; and others. Such documents are analyzed for further discussion and regularly disseminated to interested parties by FAO <sup>8</sup>.
- Overall progress in response to this recommendation is, however, slow and only partial.

**14. Recommended that FAO play an active role in helping to raise awareness of the place and role of new biotechnologies within overall tree improvement strategies and in dynamic *in situ* conservation and gene management programmes, with special reference to the need for balance in resource allocation between traditional and new technologies.**

- Overall guidance on the role of FAO in this field was provided by the 116<sup>th</sup> Session of the FAO Council (see Note FORGEN/99/3A, Annex 1).
- Active participation by members of the Secretariat to the Panel in inter-Departmental working group meetings on biotechnologies and biosafety, ensure early access to new information in these fields related to crop, forest, fish and animal genetic resources.

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<sup>8</sup> These include, *i.a.*: (i) Foster, Sam G., Jones, Norman, and Kjaer, Erik D. (1998). Economics of Tree Improvement in Development Projects in the Tropics. World Bank/Danida Forest Seed Centre. World Bank Technical Paper No.281, pp. 95-128. Washington D.C.; (ii) ACIAR (1998). Australian Tree Species Selection in China. Based on the work of D. McKenney. ACIAR Impact Assessment Series Nbr.8. ACIAR, Canberra (Australia). 25 pp; (iii) Apichart, Kaosa-ard, Verapong Sungtho and Kjaer, Erik (1998). Genetic Improvement of teak (*Tectona grandis*) in Thailand. Forest Genetic Resources Information 26:21-29. FAO, Rome. Based on Danida Forest Seed Centre Technical Note Nbr.50, August 1998; (iv) study in progress in the Social and Economic Department of FAO on models on economic value of genetic diversity (based on the work of consultant R.D. Simpson).

- Members of the Panel have been kept regularly informed about policy and technical discussions in FAO and related global discussions, and a number of relevant documents have been forwarded to Panel Members for information and further dissemination<sup>9</sup>.
- Information on the subject has been regularly published in the annual Forest Genetic Resources bulletin<sup>10</sup>.

**15. Requested that early attention be given to the recommendations of the Thirteenth Session of the Committee on Forestry related to the convening of regional, country-driven and action-oriented forest genetic resources workshops, to be organized in collaboration with countries and regions that wished to pursue the issue, under the overall umbrella of the Regional Forestry Commissions and with the technical and scientific guidance and support of the present Panel.**

- Workshops have been supported in the Sahel; and in the Pacific. Action is underway to support countries in Southern and Eastern Africa to organize a workshop in early 2000.
- Additional details are reported in Notes FORGEN/99/5, 99/6 and 99/7.

**16. Recommended that full use be made of existing networks of institutes and experts in the regions and at international level to help ensure that relevant and scientifically sound information be available in support of the decision-making process in the regional workshops.**

- See notes related to recommendations above; and Notes FORGEN/99/5, 99/6 and 99/7.

**17. Recommended that in discussing forest genetic resources priorities, countries pay attention to those key elements in genetic management strategies which can be considered common to all regions, placing these within the context of prevailing ecological, social and economic needs and priorities of the regions and countries concerned.**

- Recommendation addressed to FAO member countries.
- See esp. Notes FORGEN/99/6 and 99/7 for information on results of action taken.

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<sup>9</sup> Including the following documents: FAO (1999). Biotechnology. Document COAG/99/8. 15<sup>th</sup> Session of the Committee on Agriculture. Rome 25-29 January 1999; and (ii) FAO (1999). Recent Developments in Biotechnology as they Relate to Plant Genetic Resources for Food and Agriculture. Background Study Paper Nbr 9. Eighth Regular Session of the Commission on Genetic Resources for Food and Agriculture. Rome 19-23 April 1999.

<sup>10</sup> See *e.g.*: Haines, R.J. and Martin, B.E. (1997). Biotechnology and the Sustainable Production of Tropical Timber. Forest Genetic Resources Nbr 25:52-59. The article, extracted from a study prepared for the International Tropical Timber Organization, ITTO, provides a timely update of information published in FAO Forestry Paper 118, "Biotechnology in Forest Tree Improvement", by R.J. Haines (FAO 1994).

**18. Recommended that the know-how, experience and expertise available in countries and regions, and expertise available in IUFRO and other relevant organizations, be drawn upon in the development of a flexible, easy-to-apply, technically and scientifically sound matrix for determination of priority species and genetic resources activities, for adaptation and use as a common framework in the regional forest genetic resources workshops, taking into due consideration the format of the priority lists by region, species and activity regularly elaborated by the present Panel.**

- See Annex 1, Note FORGEN/99/5.
- Development of a “decision-making framework in forest genetic resources priorities” is underway at IPGRI, in consultation with FAO, through consultant services.
- FAO is closely involved in the work of the IUFRO Inter-Divisional Task Force on Forest Gene Resources, established following the 10<sup>th</sup> Session of the Panel in 1997, with a mandate to i.a. support FAO in this and related efforts.

**19. Recommended that development of the FAO World Wide Information System on Forest Genetic Resources, REFORGEN, be vigorously pursued, with due consideration to the need to ensure timely up-dating and verification of the information by countries concerned; and that, where possible, efforts be made to link the system directly with other related information systems for maximum benefit to users.**

- Work on REFORGEN is continuing and receives priority attention.
- Close contact is maintained with organizations which have established related databases (e.g., IPGRI and IPGRI/EUFORGEN, ICRAF, the World Conservation Monitoring Centre, and others).
- Additional details are reported in Note FORGEN/99/8.

**20. Recommended that FAO in collaboration with other relevant organizations continue to inform users of existing international and regional forest genetic resources data bases and information systems, providing information on their respective characteristics and focus; and that coordination of efforts be actively pursued.**

- As above.

**21. Recommended that FAO and its international partners continue to provide leadership and support to activities of the International Neem Network.**

- A number of publications have been issued on neem, *Azadirachta indica*, in collaboration with the Danida Forest Seed Centre, based on information and discussions with countries participating in the network. These include documents on, (i) assessment of field trials (1997); (ii) neem seed sources (1998); and (iii) trial site descriptions (1999, in press).
- Regular contact has been maintained with Network Collaborators.
- Information and advice have been provided to a number of other institutions interested in supporting activities aimed at the wise utilization of neem (including e.g. the Oxford Forestry Institute, UK).
- Additional details are reported in Note FORGEN/99/3A, Annex 2.

**22. Recommended that efforts be made to generate outside support and finance for priority activities to be carried out within the framework of the proposed Mahogany Network, based on the documentation and the project document prepared for the Neotropical species of the Meliaceae following the recommendations of the Ninth Session of the Panel.**

- A number of documents on the subject have been prepared and published by FAO and institutes interested in furthering work in this field <sup>11</sup>.
- A draft project proposal for networking activities in genetic resources of mahogany species in Latin America (with special reference to species of the genera *Swietenia* and *Cedrela*), was finalized and submitted by FAO in 1998 for comments and suggestions to institutes in potentially interested countries, as well as to a number of potential donors.
- The overall proposal and the above project document were also discussed in a Side Meeting on Genetic Resources of Mahoganies, organized in connection with the 20<sup>th</sup> Session of the Latin American and Caribbean Forestry Commission (La Habana, Cuba, September 1998).
- Official comments and/or expression of support from countries and donors are awaited.
- Documentation and information on genetic resources of *Swietenia* and *Cedrela* species has been regularly provided to the Secretariat of the Convention on International Trade in Endangered Species (CITES). FAO was represented at the meeting on Mahogany trade restrictions, held in Brasilia, Brazil in June 1998, and informed participants of action proposed, stressing its complementarity to that of CITES.

**23. Recommended that early action within the Mahogany Network focus on coordination and support to national and regional institutes in research underlying sound conservation and utilization of mahogany genetic resources, aimed notably at increasing the knowledge of the status, variation and biology of target species, and issues related to regeneration biology, silvicultural management, and disease resistance.**

- As above.

**24. Recommended that FAO help support inter-regional collaboration and linkages between the three tropical regions within the overall framework of the Mahogany Network.**

- Action at inter-regional level has been limited to facilitation of information flow.
- Action at regional level awaits, (i) expression of willingness to cooperate from countries concerned, and (ii) the identification of additional financial resources to support activities.
- Collaboration has however already been initiated between Mexico and Costa Rica (through CATIE) by the exchange of information and seed for experimental purposes, supplemented by national level action in these two countries (with some early, modest support by FAO; 1997 commitments).

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<sup>11</sup>Including: (i) FAO (1997). Genetic Resources of *Swietenia* and *Cedrela* in the Neotropics: proposals for coordinated action. Document based on the work of Patiño V., F.; Kageyama, P.Y.; Linares B., C.; Navarro P, C. Forest Resources Division, FAO Rome.58 pp.; (ii) : Patiño V. F. (1997). Genetic Resources of *Swietenia macrophylla* and *Cedrela odorata* in the Neotropics: priorities for coordinated action. Forest Genetic Resources Nbr 25:20-31; (iii) Navarro, C. (1997) Genetic variation of *Swietenia macrophylla* in Upala, Northern Costa Rica. Forest Genetic Resources Nbr 25:33-34.



**25. Recommended that publication in English, French and Spanish of the annual newsbulletin Forest Genetic Resources, be continued; and that FAO pursue its policy of publishing well-focused guides, manuals and handbooks for use by technical staff, policy makers and the general public, covering various aspects of conservation, management, collection, testing, breeding and enhancement of forest genetic resources.**

- The Forest Genetic Resources bulletin is now available in published copy and on the Internet. Preliminary provision has been made in the work programme for the coming biennia to continue publication of this document.
- Following initiation of "IPGRI FORGEN News" in 1997 (two issues published to date, English only), early discussions have been held with IPGRI to examine the possibilities to join forces and to possibly publish a joint FAO/IPGRI Forest Genetic Resources newsbulletin. Such a bulletin could conceivably also include the EUFORGEN newsletter.
- The FAO/IPGRI/DFSC/IUFRO Guide to *in situ* Conservation of Forest Genetic Resources is in the final stages of preparation, and will be published in early 2000.
- A number of other documents, including "Tropical Deforestation and Biological Diversity: assessing the risks", by B.A. Wilcox (discussed briefly by the 10<sup>th</sup> Session of the Panel), are in various stages of preparation, having been delayed due to shortage of staff and financial resources.
- Additional details are reported in Note FORGEN/99/8.

## **APPENDIX 5**

### **FAO REGULAR PROGRAMME ACTIVITIES IN FOREST GENETIC RESOURCES**

#### **I. Introduction**

Under the 1998-1999 Programme of Work and Budget, the forest genetic resources programme of FAO is carried out through sub-programme 2412, "*Plantations, Protection and Forest Genetic Resources*", in which programme elements 2412.005, "*Conservation of Forest Genetic Resources*" and 2412.008.002, "*Plantation Development and Tree Improvement*" (especially, but not solely, activity .002, "*Tree Improvement*"), are focused on this issue. Very close links are maintained with sub-programme 2411, "*Forest Resources Assessment and Management*", especially programme element 2411.001, "*Management of Forests*".

Sub-programme 2413, "*Forest Conservation, Wildlife and Contribution to Food Security*", and more specifically its programme element 2413.004 "*Wildlife and Protected Area Management*", complements the forest genetic resources activities at the level of species and ecosystem conservation, wildlife conservation and management, and the conservation of biological diversity in forest ecosystems in general.

Coordination and linkages with genetic resources activities in the fields of agriculture (crops, horticultural species, "industrial crops", forage species), animal husbandry and fisheries, are maintained through inter-Departmental working groups on Biological Diversity; and Biosafety through the Secretariat of the Commission on Genetic Resources for Food and Agriculture; and through technical contacts between concerned Divisions and units in the Agriculture, Forestry, Fisheries, Sustainable Development and Economic and Social Departments.

The present note focuses on the forest genetic resources programme of the Organization (sub-programme 2412), for which the FAO Panel of Experts on Forest Gene Resources provides technical and scientific guidance.

Financial contributions for FAO Regular Programme forest genetic resources activities for the period under review (the "normative activities"), are presented in Secretariat Note FORGEN/99/4B.

#### **II. General Description**

The forest genetic resources programme of FAO works through, and in partnership with, national institutes; and helps catalyze and promote harmonization of activities at international level.

The overall goal of the programme is institutional strengthening through direct support to national institutes, and through promotion of and support to networking and twinning. The programme promotes action aimed at the conservation of forest genetic resources *in* and *ex situ*; and the availability and use of optimal planting materials, including exchange of reproductive materials and technologies for their conservation and improvement at local and national levels. Support to exchange of technologies and dissemination of information form important components of the programme. The programme, further, includes the gathering of data and information on the state of forest genetic resources in the world, and making such information available to countries, mainly for policy, planning and decision making purposes.

Table 1 lists the programme elements in the 1998-99 Forestry Department Regular Programme, in which substantial forest genetic resources activities are involved. Other programme elements including wildlife protection and protected areas, such as national parks, also include important forest genetic resources activities. Details of budget allocations for non-staff resources by programme element are provided in Note FORGEN/99/4B<sup>12</sup>.

**Table 1: 1998-99 budget allocations to Regular Programme elements with components relevant to forest genetic resources, and estimated importance of these components (sub-programme 2412)**

Programme Element	Budget (US\$ 000)	Estimated importance of Forest Genetic Resource components
Conservation of forest genetic resources	577	High
Plantation development and tree improvement	688	High

### III. Main activities 1998-1999

*Exploration, collection, evaluation of forest genetic resources*, in collaboration with national institutes and international organizations, such as the International Union of Forestry Research Organizations (IUFRO), relevant Centres of the Consultative Group on International Agricultural Research, and other international partners. Work on exploring, conserving and better utilizing forest tree genetic variation, focusing on socio-economically important species for the dry and humid tropics. In line with recommendations of the 10<sup>th</sup> Session of the Panel, recent activities have concentrated mainly on species of the genera *Azadirachta*, neem; and *Swietenia*, mahoganies (see Annexes II and III).

*Tree improvement*. FAO supports and advises national institutes, on request. In regard to biotechnologies, see Annex I<sup>13</sup>.

*Conservation of genetic resources*. The programme actively contributes to elaborating forest genetic resources conservation methodologies, both *in situ* and *ex situ*, and coordinates the evaluation of practical experiences with *in situ* and *ex situ* conservation stands. The DANIDA Forest Seed Centre, Denmark, provides technical and financial assistance. The programme is carried out in partnership with participating national institutes. Assessments have been carried out on *in situ* conservation stands of *Tectona grandis* and *Pinus merkusii* in Thailand, *Baikia plurijuga* in Zambia and *Acacia senegal* in Burkina Faso, in 1997 and 1998. *Ex situ* conservation stands (mainly eucalypts and tropical pines) were evaluated in Kenya, Tanzania and Zambia in 1997, in Brazil in 1998, and in Côte d'Ivoire in 1999. In collaboration with IPGRI, other relevant CGIAR Centres, IUFRO and the DANIDA Forest Seed Centre, FAO is finalizing a practical guide on *in situ* forest genetic resources conservation. A "Forestry Department Information Note" on the subject of management of forest genetic resources has been prepared, widely disseminated, and made available on the FAO Forestry Department Homepage<sup>14</sup> (copies available).

<sup>12</sup> Figures are based on the 1998-1999 Programme of Work and Budget and include Staff and Non-Staff Resources; figures provided in Note FORGEN/99/4B include Non-Staff Resources only.

<sup>13</sup> See also FAO/CPGR 1999 Background Study Paper No.; 9 (by C. Spillane), distributed separately.

<sup>14</sup> <http://www.fao.org/WAICENT/FAOINFO/FORESTRY/infonote/default.htm>

*Wildlife, and protected area management* is part of the *Forest Conservation, Wildlife and Contribution to Food Security* programme managed by the Forest Resources Division. The programme element promotes wildlife and protected area management systems and related institutional development and training. In 1998, advice was provided to countries of the Near East Forestry Commission (Jordan, Syria, Saudi Arabia, Turkey, Iran, Lebanon and Sudan) on institutional arrangements for protected areas. The training needs of countries in Western Asia were assessed in 1998. The programme is working on the sustainable utilization of wildlife for food and income generation. Studies, in particular in African and Latin American countries, have documented game husbandry techniques for the Paca, *Agouti paca*, the Grasscutter, *Thryonomys swinmderianus*, and other small mammals. In 1997/98, the programme provided technical support to 15 biological diversity conservation projects for surveys and management of wild fauna and flora. The programme also assists member countries to fulfil the requirements of international conventions, like CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora); RAMSAR (the Convention on Wetlands of International Importance especially as Waterfowl Habitat); the Bonn Convention on Migratory Species (CMS), and the CBD (the Convention on Biological Diversity). An International Technical Consultation on Protected Area Management and Sustainable Rural Development will be organized by FAO, in collaboration with a number of international partners, in Zimbabwe 26-29 October 1999.

*Information activities:* FAO has continued developing the World-Wide Information System on Forest Genetic Resources (REFORGEN), to support policy and technical decisions for genetic conservation, at national, regional and international levels. It contains information provided by countries through questionnaires, complemented by four international workshops on forest genetic resources, and data assembled in preparation for the Leipzig International Technical Conference on Plant Genetic Resources (1996). A user-friendly interface is being developed, to allow information retrieval through the Internet. The process of updating and verifying the existing data has been initiated, and will continue at regular intervals in the future.

The FAO homepage on forest genetic resources provides detailed information on all FAO's activities in this field. The homepage, which has recently been updated and expanded, is now available in English, French and Spanish.

FAO annually publishes a Forest Genetic Resources information bulletin. The bulletin is published in English, French and Spanish in 3,800 copies and, in addition, is posted on the Internet at FAO's homepage on forest genetic resources.

In line with recommendations of the Panel of Experts on Forest Gene Resources, FAO in collaboration with IUFRO is reviewing concepts and terms in the field of forest genetic resources (see [Annex IV](#)).

*International collaboration:* FAO works closely with i.a. IUFRO, the CGIAR Centres (notably the International Plant Genetic Resources Institute, IPGRI; the Centre for International Forestry Research, CIFOR; and the International Centre for Research in Agroforestry, ICRAF), the CBD Secretariat, universities and national forest research institutes. In March 1998, IPGRI, FAO and other partners, organized a regional training course on the conservation and sustainable use of forest genetic resources, in Ouagadougou, Burkina Faso. In August 1998, the Chinese Forestry Academy, with IUFRO and FAO, organized an international consultation on the contributions of genetics to the sustained management of global forest resources, in Beijing, China.

In March 1997, the FAO Committee on Forestry (COFO) reviewed a number of major forest policy issues, and *“agreed that there was a need to strengthen national regional and international activities in the conservation and sustainable use of forest genetic resources, to help enhance country capabilities and to support the exchange of information and know-how”*. *“Some delegations were of the opinion that efforts to consider a global plan of action on conservation and sustainable utilization of forest genetic resources were premature. Other delegations suggested that FAO should pursue efforts to develop regional plans of action for the conservation and sustainable use of forest genetic resources as a first step to develop a global plan of action”*. COFO also noted that *“FAO, in conjunction with Regional Forestry Commissions and countries that request it, could convene regional and sub-regional forest genetic workshops complementary to those already held in 1995 for boreal and temperate zones”*.

As a follow-up, FAO is supporting the organization of a series of sub-regional workshops on forest genetic resources, to assist countries to define priority species and needs, and elaborate coordinated regional action plans, focusing on a limited number of priority species and activities.

In collaboration with IPGRI, ICRAF and other national and international organizations, a sub-regional workshop, on the conservation, management, sustainable utilization and enhancement of forest genetic resources in dry-zone sub-Saharan (Sahelian) Africa, was organized in Ouagadougou (Burkina Faso), in September 1998, leading to the preparation of a sub-regional forest genetic resources action plan (see Note FORGEN/99/6). A similar workshop was held for the South Pacific in April 1999, in collaboration with the Australian Agency for International Development, the Australian-coordinated SPRIG project (South Pacific Regional Initiative on Forest Genetic Resources), the Secretariat of the Pacific Community, and other regional partners (see Note FORGEN/99/7). Another workshop is planned in late 1999 by countries in Southern and Eastern Africa, under the auspices of the Southern African Development Community (SADC). A “Forestry Department Information Note” on the subject has been prepared, widely disseminated, and made available on the FAO Forestry Department Homepage (copies available). See also Note FORGEN/99/5.

The Tenth Session of the Panel of Experts on Forest Gene Resources, 9 - 11 September 1997, made recommendations regarding the exploration, collection, testing and evaluation, exchange, conservation *in* and *ex situ*, and use of forest genetic resources (including breeding and the role of new biotechnologies in forest tree improvement), and updated the lists of priority and important species. Its *Report* (68 pp) is available in hard copy and at the FAO Internet homepage in three languages (see Note FORGEN/99/3). A “Forestry Department Information Note” on the Forest Gene Panel has been prepared, widely disseminated, and made available on the FAO Forestry Department Homepage (copies available).

FAO’s forestry field projects include components on seed-collection, production, handling and exchange; tree-improvement and breeding; ecosystem and forest genetic resource conservation, *in* and *ex situ*; and the integration of genetic conservation into forest management practice and protected area management. Field projects are now directly managed by FAO Regional Offices.

**APPENDIX 5, Annex I**

**BIOTECHNOLOGIES IN FOOD AND AGRICULTURE: FAO'S ROLE**

Report on the 116<sup>th</sup> Session of the FAO Council. Rome 14-29 June 1999

**Extract from Document CL 116/Rep. (June 1999):**

- § 25 [In particular,] the Council appreciated the need for FAO to have a coherent programme on agricultural biotechnology to assist Member Nations in obtaining the full benefits of new developments while minimizing risks. FAO's role as a forum for the discussion of issues and for standard-setting, and as an 'honest broker' of quality science-based information, through mechanisms such as the International Plant Protection Commission (IPPC) and Codex Alimentarius, was underscored in general, and in relation to biotechnology in particular.

## **APPENDIX 5, Annex II**

### **ACTIVITIES OF THE INTERNATIONAL NEEM NETWORK<sup>15</sup>**

Neem, *Azadiracta indica* A. Juss, is a widely used, evergreen multipurpose tree native to the Indian subcontinent and Southeast Asia. The International Neem Network was established in 1994 with the long term objective to improve the genetic quality and adaptability of neem used in plantations and the sound utilization of this important species world-wide, with special focus on meeting the needs of rural people. The network, which at present represents national institutes in 22 countries, is still expanding; China joined in 1997 and Guinea has recently applied to become a member. The network has undertaken activities in relation to provenance exploration, seed collection and exchange and has established coordinated provenance trials on a range of sites. In addition, the network has decided to undertake research in seed physiology and technology, genetic diversity and reproductive biology as well as studies on variation in chemical compounds. FAO has been entrusted the global coordination of network activities. For further description of the International Neem Network, its objectives, organization, networking principles and activities in the early stages of the network please refer to articles in *Forest Genetic Resources* No. 22 (1994), 24 (1996) and 25 (1997).

#### **Establishment of International Provenance trials:**

A total of 25 seed sources from 11 countries, sampling the entire eco-geographical variation in the range of distribution of the species, have been identified, described and seed collected. 25 seedlots were exchanged among countries and in 1995-1997 a total of 36 trials were established in 17 countries.

Assessment of the trials has now begun following guidelines agreed upon by the network collaborators.

*Table 1. Provenance trials established within the International Neem Network*

Country	Number of trials established	Country	Number of trials established
Bangladesh	2	Pakistan	1
Burkina Faso	1	Philippines	2
Chad	1*	Senegal	3
India	6	Sri Lanka	1
Lao	1	Sudan	1*
Mali	2	Tanzania	4
Myanmar	3	Thailand	2
Nepal	2	Vietnam	2
Nicaragua	2		

\* Due to low survival rate the trials in Chad and Sudan have been closed.

The International Neem Network has recently issued two booklets related to its activities:

- International Neem Network (1997): Assessment of International Provenance Trials (Guidelines on assessment of trials established within the framework of the Neem Network)
- International Neem Network (1998): Description of Neem seed sources (Detailed information on seed sources included in the provenance trials established within the framework of the Neem Network)

<sup>15</sup> Note published in *Forest Genetic Resources* number 26, p.30 (FAO 1998).

## **APPENDIX 5, Annex III**

### **THE CONSERVATION AND SUSTAINABLE UTILIZATION OF MAHOGANY GENETIC RESOURCES<sup>16</sup>**

#### **Background**

The most important Meliaceae genera in the neotropics are *Swietenia* and *Cedrela*. For more than a century the mahoganies, as they are commonly known, have been of fundamental importance to national progress in many countries in Latin America, supporting the advancement of rural communities, the development of forest industries and the generation of local and national employment and revenue. Species of these two genera are important in plantation programmes also outside of their natural range, notably in countries in the Asia-Pacific region.

Increasing human populations and new demands have led to changes in land use in countries in which species of these genera occur naturally. Related loss of forests has, in turn, led to the disappearance of some specific sub-populations of mahogany species. Through dysgenic selection (harvesting of the phenotypically most desirable individuals) the genetic constitution of accessible natural populations of intensively used species in forested areas is also likely to have changed over time in a manner which, if allowed to continue, may endanger the sustainability of these populations, and which may pose difficulties to future adaptation of the species to environmental changes and limit the possibilities for genetic improvement to meet evolving human needs.

Based on concern about possible deterioration of the genetic quality of the mahoganies which, unless addressed in a timely manner, may negatively affect countries in which these species occur, the *FAO Panel of Experts on Forest Gene Resources* has over the past years flagged the need for national and regional action and international support to research and studies on the distribution and variation of mahogany species and corresponding trends, with the aim of furthering the conservation and sustainable utilization of this important resource based on improved knowledge. These calls for action are in line with similar recommendations passed by a number of national and international institutes and fora, notably by the *Convention on International Trade in Endangered Species* (CITES).

#### **Action Taken to Date and Future Plans**

Information on activities related to genetic resources of *Swietenia* and *Cedrela* spp. in the neotropics was published in *Forest Genetic Resources* No. 25 (FAO 1997). Copies of the report, "*Genetic Resources of Swietenia and Cedrela in the Neotropics: proposals for coordinated action*" (FAO 1997), which was briefly described in the above issue of FGR, are available from the Forest Resources Division of FAO, Rome in Spanish and in English.

An *International Symposium on Genetic Resources, Ecology and Management of Big-Leaf Mahogany (Swietenia macrophylla)*, was organized in October 1996 in Puerto Rico by the *International Institute of Tropical Forestry* (IITF), in technical collaboration with FAO. The symposium, which was attended by experts from countries in Latin America and the Caribbean and from a range of countries in other regions interested in neotropical mahogany species, identified a number of priority issues in need of attention and passed recommendations for related action (proceedings *in press*; IITF 1999). The participants also preliminarily discussed a proposal by FAO to support networking activities among institutes working on the conservation and management of genetic resources of neotropical mahogany species. The general aim of the proposed forest genetic resources network was to support the programmes of national institutes already active in this field in

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<sup>16</sup> Note published in *Forest Genetic Resources* no. 26, pp.49-50 (FAO 1998)



countries which expressed a wish to participate, and to help strengthen links and collaboration between them, thus ensuring complementarity of action. Country-driven action within the framework of the network would be carried out in a manner complementary to already on-going or planned work in this and related fields coordinated by other agencies or institutions.

A draft project proposal for networking activities in genetic resources of mahogany species was subsequently elaborated by FAO consultants from the region. The proposal was submitted by FAO in 1997 and 1998 for comments and suggestions to institutes in potentially interested countries in Latin America and the Caribbean and in other tropical regions. The proposal was also made available to the CITES Secretariat, and has been preliminarily discussed with participants in recent CITES-related meetings, with a view to streamlining possible future forest genetic resources activities with trade-related action being proposed within the framework of CITES.

The draft proposal was discussed in a side meeting on genetic resources of mahoganies, organized in connection with the 20th Session of the *Latin American and Caribbean Forestry Commission* in La Havana, Cuba, in September 1998. The side meeting was attended by some thirty participants representing thirteen countries and three regional or international organizations. While countries of the *Amazon Cooperation Treaty* cautioned against potential overlap with planned activities within the framework of CITES, others showed enthusiasm for the proposal, which they confirmed should, as originally proposed, focus on activities related to the conservation, enhancement and sustainable utilization of mahogany genetic resources, and include a range of species of Meliaceae occurring in the region. The participants agreed to further discuss the draft proposal in their respective countries and, following such discussions and careful in-country analysis, provide additional comments to FAO for incorporation into the proposal.

Based on feedback from countries and on availability of funding, consideration will be given to the organization of a regional workshop under the overall coordination of FAO to finalize the proposals and to initiate corresponding activities.

**APPENDIX 5, Annex IV**

**TERMINOLOGY IN FOREST GENETIC RESOURCES<sup>17</sup>**

Following recommendations passed at the tenth session of the FAO Panel of Experts on Forest Gene Resources (1997), FAO and IUFRO have joined forces to develop of a glossary of terms frequently used in the field of forest genetic resources. The objective of the glossary is not only to record established and widely agreed definitions of some common terms, but also to show the way and the sense some professions, organizations or countries use the terms. Instead of providing one single definition, the glossary will aim at providing, for a giving word, various definitions and meaning developed by various groups for their specific scope and objectives. It should reflect the diversity of users and their complementary approaches, and incorporate their definitions or explanation, in addition to providing standard, universal definitions. The work is carried out in collaboration between IUFROs SylvaVoc (Mrs Renate Prüller), the newly created IUFRO Task Force on Forest Genetic Resources (chaired by Francis Yeh, the University of British Columbia, Canada) and FAO.

The terms selected for the exercise include the following :

Biological diversity - agrobiodiversity	Genetic diversity
Biotechnology -genetic engineering -genetic markers/molecular markers?	Genetic resources - germplasm - value of genetic resources
Conservation - <i>in situ</i> conservation - <i>ex situ</i> conservation -genetic conservation	Management of genetic resources
Genetic variation	Tree improvement - domestication
	Vegetative propagation - micropropagation - macropropagation

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<sup>17</sup> Extracted from: Forest Genetic Resources No. 26, p.12. FAO 1998.

## **APPENDIX 6**

### **FINANCIAL CONTRIBUTIONS IN FOREST GENETIC RESOURCES: NON-STAFF RESOURCES, FAO'S REGULAR PROGRAMME (RP) (SUB-PROGRAMME 2412)**

This Appendix summarizes expenditures of FAO's Regular Programme in Forest Genetic Resources in 1998 and 1999 (non-staff resources; sub-programme 2412). Regular Programme activities are described in more detail in Appendix 5. The following Tables are included in the present Appendix:

1. Summary Table
2. Breakdown of Expenditure by Category
3. Dissemination of Information
4. Panel of Experts on Forest Gene Resources
5. Support to Countries in the Preparation of Regional Strategies
6. Development of Methodologies
7. Contributions to Workshops in Support of Species Networks, IUFRO etc.

The tables contain details on expenditures which bear direct relation to the work and the recommendations of the FAO Panel of Experts on Forest Gene Resources. They do not include staff time or funding related to the FAO Field Programme administrated by the FAO Regional Offices.

**FINANCIAL CONTRIBUTIONS IN FOREST GENETIC RESOURCES:**  
**NON-STAFF RESOURCES. FAO'S REGULAR PROGRAMME (RP)**  
**SUB-PROGRAMME 2412**

(excludes time and salaries of FAO staff and activities carried out by Regional Offices)

(1) SUMMARY TABLE	Biennium 1996/1997	1998	1999
(1) Dissemination of information	63 400 <sup>18</sup>	29 000	17 800
(2) Panel of Experts on Forest Gene Resources	99 500 <sup>19</sup>	4 600	77 000
(3) Support to preparation of regional strategies, direct support to national institutes	156 400	94 700	51 000
(4) Development of methodologies	<sup>20</sup> /	-	2 000
(5) Contributions to international workshops/meetings	<sup>20</sup> /	14 000	-
<b>TOTAL EXPENDITURE:</b>	<b>319 300</b>	<b>142 300</b>	<b>147 800</b>

NB1: Actual expenditure 1998 and estimated expenditure 1999.

NB2: 1998 and 1999 figures include funds earned from field backstopping missions and other services by staff.

NB3: Figures in Table 1 of Note FORGEN/99/4A, are not directly comparable as they include also RP staff costs. Figures in the present Table include non-staff resources only.

<sup>18</sup> The 1996/97 budget included originally also allocations for printing of *In situ* Guide (based on the work of L. Thomson); and document, "Tropical Deforestation and Biological Diversity" (based on the work of B.A. Wilcox). These documents were not ready for printing in the biennium 1996/97, and actual expenditure was therefore \$US 32,000 less than figures indicated in documentation reviewed for the biennium at the 10<sup>th</sup> Session of the Panel.

<sup>19</sup> This figure covers point (2) and parts of point (3)= costs related to preparations for the Leipzig International Technical Conference on Plant Genetic Resources.

<sup>20</sup> Included in points (1)-(3)

**FINANCIAL CONTRIBUTIONS IN FOREST GENETIC RESOURCES: NON-STAFF RESOURCES**  
**FAO'S REGULAR PROGRAMME (RP), SUB-PROGRAMME 2412**

(excludes time and travel of FAO staff; and activities carried out under FAO's field programme)

<b>(2) BREAKDOWN OF EXPENDITURE BY CATEGORY</b>	<b>1998</b>	<b>1999</b>	<b>OBSERVATIONS</b>
Contracts, Consultants	52 700	32 300	
Travel costs (including DSAs and terminals), non-staff	64 800	79 000	
Miscellaneous	24 800	36 500	Includes publication, interpretation at Gene Panel Meeting, homepage development costs, etc.
<b>TOTAL EXPENSES:</b>	<b>142 300</b>	<b>147 800</b>	

NB1: 1999 figures are based on estimates

**FINANCIAL CONTRIBUTIONS IN FOREST GENETIC RESOURCES: NON-STAFF RESOURCES**  
**FAO'S REGULAR PROGRAMME (RP), SUB-PROGRAMME 2412**

(excludes time and travel of FAO staff; and activities carried out under FAO's field programme)

(3) DISSEMINATION OF INFORMATION	1998	1999	OBSERVATIONS
<ul style="list-style-type: none"> <li>- <u>Forest Genetic Resources (annual bulletin)</u></li> <li>Translation</li> <li>Publication</li> </ul>	<p align="center">9 700</p> <p align="center">9 300</p>	<p align="center">5 600</p> <p align="center">10 000</p>	<p>Contracts with translators showed a positive balance in 1998, which has been used in 1999</p>
<ul style="list-style-type: none"> <li>- <u>Homepage Development</u></li> <li>Conversion formats</li> <li>Translation</li> </ul>	<p align="center">-</p> <p align="center">-</p>	<p align="center">400</p> <p align="center">1 800</p>	<p>Conversion of Word text to html document</p> <p>The homepage is now available in E, F and S</p>
<ul style="list-style-type: none"> <li>- <u>Development of REFORGEN</u></li> <li>Programme development and upgrading</li> </ul>	<p align="center">10 000</p>	<p align="center">-</p>	<p>Upgrading of stand-alone data base and development of an on-line version (through contractual services)</p>
<p align="right"><b>SUB-TOTAL (3):</b></p>	<p align="center"><b>29 000</b></p>	<p align="center"><b>17 800</b></p>	

NB1: 1999 figures are based on estimates

**FINANCIAL CONTRIBUTIONS IN FOREST GENETIC RESOURCES: NON-STAFF RESOURCES**  
**FAO'S REGULAR PROGRAMME (RP), SUB-PROGRAMME 2412**

(excludes time and travel of FAO staff; and activities carried out under FAO's field programme)

<b>(4) PANEL OF EXPERTS ON FOREST GENE RESOURCES</b>	<b>1998</b>	<b>1999</b>	<b>OBSERVATIONS</b>
<u>10<sup>th</sup> Session</u>			
Publication of report	4 600	-	The report is available in hard copy and on line in E, F and S
<u>11<sup>th</sup> Session</u>			
Meeting costs	-	18 000	Interpretation (E,F,S)
Travel of participants	-	51 000	Including DSAs and terminals
Translation and publication of report	-	8 000	Report will be available in E, F, S. Hard copy and html version
<b>SUB-TOTAL (4):</b>	<b>4 600</b>	<b>77 000</b>	

NB1: 1999 figures are based on estimates

**FINANCIAL CONTRIBUTIONS IN FOREST GENETIC RESOURCES: NON-STAFF RESOURCES**

**FAO'S REGULAR PROGRAMME (RP), SUB-PROGRAMME 2412**

(excludes time and travel of FAO staff; and activities carried out under FAO's field programme)

<b>(5) SUPPORT TO COUNTRIES IN THE PREPARATION OF REGIONAL STRATEGIES</b>	<b>1998</b>	<b>1999</b>	<b>OBSERVATIONS</b>
(i) Support to national and regional institutions			
- Country visits (consultancies)	12 000		Consultancies by B. Kigomo and A. Nikiéma to countries in the Sahel
- Preparation of national reports	10 700	4 000	Contracts with Sahelian countries (1998); and SADC countries (1999)
(ii) Travel costs (experts, participants)	54 300	28 000	1998: Sahelian countries; 1999: Pacific Islands
(iii) Meeting costs	16 000	4 000	1998: Sahelian countries; 1999: SADC countries
(iv) Preparation, translation & publication of Reports	1 700	15 000	1998: Sahel; 1999: Sahel and the Pacific Islands
<b>SUB-TOTAL (5):</b>	<b>94 700</b>	<b>51 000</b>	

NB1: 1999 figures are based on estimates

NB2: Support was provided to Sahelian African countries in 1998

NB3: Support was provided to Pacific Island and SADC countries in 1999

NB4: The preparation of the Sub-Regional Action Plan on FGR for Sahelian Africa was supported by FAO, IPGRI and ICRAF (see Note FORGEN/99/6)

NB5: The preparation of the Sub-Regional Action Plan on Forest and Tree Genetic Resources for the Pacific Islands was supported by FAO, AusAID, SPRIG, SPREP, SPC/PIF&TSP and the Forestry Division of Samoa (see Note FORGEN/99/7)



**FINANCIAL CONTRIBUTIONS IN FOREST GENETIC RESOURCES: NON-STAFF RESOURCES**  
**FAO'S REGULAR PROGRAMME (RP), SUB-PROGRAMME 2412**

(excludes time and travel of FAO staff; and activities carried out under FAO's field programme)

<b>(6) DEVELOPMENT OF METHODOLOGIES</b>	<b>1998</b>	<b>1999</b>	<b>OBSERVATIONS</b>
Guide to <i>in situ</i> conservation of forest genetic resources			Contractual work under way 1998/99 using funds committed in 1997
<b>SUB-TOTAL (6):</b>		2 000	Publication in collaboration with IPGRI

NB1: 1999 figures are based on estimates

**FINANCIAL CONTRIBUTIONS IN FOREST GENETIC RESOURCES: NON-STAFF RESOURCES**  
**FAO'S REGULAR PROGRAMME (RP), SUB-PROGRAMME 2412**

(excludes time and travel of FAO staff; and activities carried out under FAO's field programme)

<b>(7) CONTRIBUTIONS TO WORKSHOPS IN SUPPORT OF SPECIES NETWORKS, IUFRO etc.</b>	<b>1998</b>	<b>1999</b>	<b>OBSERVATIONS</b>
<i>Swietenia</i> and <i>Cedrela</i> species in the Neotropics	7 500		Side meeting to 20 <sup>th</sup> Session of the Latin American and Caribbean Forestry Commission: travel costs of experts, documentation
Other initiatives	6 500		Including SADC/TSCN Meeting, Gaborone; FAO/IUFRO Symposium on Recalcitrant Seeds (Malaysia); and Misc.
<b>SUB-TOTAL (7):</b>	<b>14 000</b>		

## APPENDIX 7

### PROGRESS TOWARDS THE DEVELOPMENT OF REGIONAL ACTION PLANS ON FOREST GENETIC RESOURCES

The well-being of trees and forests and the sustained production of the goods and services that they provide are dependent on the maintenance and management of their genetic diversity. However, habitat destruction and alteration, deforestation and changes in land use, atmospheric pollution, climate change and inappropriate forest harvesting practices pose increasing threats to the integrity of forest genetic resources.

Growing concern over the state of forest ecosystems, species and genetic resources has led to the development of national conservation policies in many countries. However, strictly national programmes have obvious limitations, as the natural distribution of most forest tree species does not respect national borders. The number of species of ascertained or potential value to human communities is expanding steadily. Developing countries, frequently found in species-rich tropical areas, often have limited access to financial and manpower resources. Access, transfer and utilization of genetic resources have become issues of international concern.

In March 1997, the 13th Session of the Committee of Forestry recognized the urgent need for concerted action to strengthen national, regional and international activities related to forest tree genetic resources, and agreed that "FAO, in conjunction with Regional Forestry Commissions and countries that requested it, could convene regional and sub-regional forest genetic workshops complementary to those already held in 1995 for boreal and temperate zones".

Following this recommendation, and under the guidance of the FAO Panel of Experts on Forest Gene Resources, action has been taken to facilitate a series of regional forest genetic resources workshops as a first step towards the development of regional plans of action. The overall goal of such sub-regional and regional action plans is to help countries ensure that forest genetic resources are conserved and sustainably utilized as a basis for local and national development, including economic and social advancement, food security, poverty alleviation, environmental conservation, and the maintenance of cultural and spiritual values. The immediate objective of the workshops is to help countries and regions to define priorities and requirements in the management of forest genetic resources, including their conservation, enhancement and sustainable utilization.

In September 1998, FAO, the International Plant Genetic Resources Institute (IPGRI) and the International Centre for Research in Agroforestry (ICRAF) joined forces to help countries in the Sahel to organize a workshop on the 'Conservation, Management, Sustainable Utilization and Enhancement of Forest Genetic Resources'. The objectives of the workshop were to assist countries in the sub-region to assess the status of their forest genetic resources, propose and agree on priority actions, and make recommendations for immediate follow-up and implementation of action in this field.

Thirty-five participants from 15 countries and six international, regional, bilateral and national agencies attended the workshop, held in Ouagadougou, Burkina Faso 22-24 September 1998. The participants identified the need for, and agreed to prepare, a sub-regional plan of action on forest genetic resources for sub-Saharan Sahelian Africa. A synthesis on the state of the region's genetic resources, based on national reports prepared by 18 countries, is being finalized (FAO 1999), and will form the background of the sub-regional plan. For details of this workshop see Note FORGEN/99/6.

A workshop covering countries of the South Pacific Islands was held in Apia, Samoa 12-14 April 1999 as a follow-up to the above recommendations by COFO, and recommendations made by Heads of Forestry of Pacific Island countries and territories in September 1998. The Australian-funded project 'South Pacific Regional Initiative on Forest Genetic Resources' assisted in the coordination of the preparations and organization of the meeting, in collaboration with the Australian Agency for International Development (AusAID), the Secretariat of the Pacific Community, FAO and other regional, bilateral and national partners. For details of this workshop see Note FORGEN/99/7.

A workshop covering countries of the Southern African Development Community (SADC) is scheduled to be held in December 1999 or during the first half of 2000, following discussions at the third meeting of the SADC Technical Sub-Committee for Forest Research (TSCFR), held in Gaborone, Botswana in October 1998.

Similar workshops are envisaged in other sub-regions and eco-regions, pending identification of additional funding and partnerships.

This flexible, country-driven, step-by-step process was commended by the XI World Forestry Congress held in Antalya, Turkey (October 1997), and by the 'FAO/IUFRO All-Division Two Consultation on Forest Genetics and Tree Improvement' (Beijing, China; August 1998). The process complements other initiatives such as the preparation of national biodiversity assessments of status and action plans within the framework of the Convention on Biological Diversity.

The above workshops usually involve preparation of a national report by each participating country. The format and contents of these reports are decided by the countries and organizers in consultation with FAO, and some technical guidelines are proposed, notably for the classification of priority species (see Annex I of the present Appendix)<sup>21</sup>. Data gathered, analyzed and synthesized in the course of regional workshops will complement the information made available and regularly updated by the Panel of Experts on Forest Gene Resources, and information stored in the FAO World-Wide Information System on Forest Genetic Resources (REFORGEN). Information will be disseminated through the FAO Internet Site on forest genetic resources<sup>22</sup>; and through the Clearing House Mechanism of the Convention on Biological Diversity.

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<sup>21</sup> Comments and suggestions on the methodology will be appreciated.

<sup>22</sup> Address of site: <http://www.fao.org/waicent/faoinfo/forestry/forgenres/homepage/content.htm>

**APPENDIX 7, Annex I**

**DRAFT TECHNICAL GUIDELINES ON THE  
IDENTIFICATION AND DEFINITION OF NATIONAL PRIORITIES**

**Document Distributed, Discussed and Utilized at the  
Regional Workshop on the Conservation, Management,  
Sustainable Utilization and Enhancement of Forest Genetic Resources  
in the Sub-Saharan African (Sahelian) Region**

**Basic Issues and Background**

1. The well being and productivity of forests are dependent on the structure and dynamics of their genetic foundation. Neglect or mismanagement will lead to loss or reduction of genetic resources, increased ecological vulnerability and foregone potential gains from breeding. A basic question in the conservation and management of genetic resources is, then: how do we maintain, manage and enhance useful genetic variation for the continued evolution, adaptation and improvement of trees and shrubs to meet present-day and future human and environmental needs and demands, while limiting environmental hazards ?
2. For these issues we need to look beyond the populations of trees we use or benefit from today, to the past populations that gave rise to them and to the populations likely to be needed or useful in the future. We must, furthermore, consider tree populations which today may be of peripheral interest but that may contain variation that will be useful under other conditions in the future. We must also consider some species that may have little present social, economic or environmental value but may have future value either in themselves or as sources of genes for use in breeding.
3. The management of genetic resources is a complex task, in which problems and solutions vary according to perceived threats, the amount of basic knowledge about the genetics and variation of the species involved and about their management and silviculture, the immediacy of use of the resources and, to a large extent, availability of funding and institutional capacities
4. Decisions about priorities in the conservation of genetic resources will depend on value judgements. They are to a large extent determined by the primary beneficiary of the conservation effort. In this situation it is clear that dialogue and involvement of all stakeholders is of utmost importance, and that a holistic view is necessary. In addition to describing the technical and scientific management options that are available to us, we should thus also consider the values placed on genetic resources by various actors. This leads to a series of questions that should be addressed, such as: who benefits? who invests in programmes affecting the resources? how can short, medium and long-term support to genetic management programmes be secured? How can we assure that investments generated are based on some sense of justice, taking into consideration the needs of all concerned?

### **Workshops: strategy and elaboration of priorities**

5. According to its mandate and mission, and in line with requests and recommendations made to it, the Forestry Department of FAO proposes to address forest genetic resources issues *i.a.* through assisting countries to convene regional and sub-regional forest genetic resources workshops. In this regard, country-driven processes will be assisted to identify priority species and activities and to identify strategies for relevant follow-up action.

6. Relative priorities for action within any one country will be determined by countries concerned, by balancing socio-economic, environmental and cultural values assessed in the light of susceptibility or likelihood of loss or degradation of genetic resources of target species. Sub-regional and regional priorities will, in addition, take into account common interests and commonality of priority species and activities; and possibilities to complement action through assigning regional and sub-regional lead organizations for given species and/or activities.

7. In March 1993, a questionnaire on forest genetic resources was sent by FAO to member countries. The questionnaire requested data for inclusion in the then proposed REFORGEN database. REFORGEN contains information on the present status of forest genetic resources in each country, including also information on on-going programmes and priorities in conservation and tree improvement, seed availability, etc. The originally included data is presently being verified with countries. Data will be further up-dated and complemented by FAO, through inclusion of additional country-based information, including data derived from National Reports prepared for the present series of forest genetic resources workshops; and from the regularly up-dated lists of priority species by region and activity, elaborated by the FAO Panel of Experts on Forest Gene Resources.

8. The present document outlines provisional guidelines for prioritising species, with due regard to information available in the above sources.

### **List of important (target) species, their values and uses**

The first step in defining a regional/sub-regional forest genetic resources action programme will be to list priority species targeted for action (incl. provenances of special value), and to assess the nature of the value attached to them.

#### **- Value of target species**

9. Regarding target species, Namkoong (1986)<sup>23</sup> described genetic management for three groups of species:

1. Species of current socio-economic importance;
2. Species with clear potential or future value;
3. Species of unknown value given present knowledge and technology.

Species in (1) are likely to be already included in selection and breeding programmes, or at least anticipated to be included in such programmes in the near future. These may range from programmes which involve systematic testing, evaluation and breeding for different kinds of gene effects for a range of objectives, in several different geographical areas; to those in which more simple systems of mass-selection are used and applied.

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<sup>23</sup> Adapted from: Namkoong, Gene (1986). Genetics and the Future of the Forests. Unasylva Vol. 38 Nbr 152. 1986/2, pp. 2-18 (available in English, French, Spanish).

In regard to (2), the main need will be to clarify the nature and patterns of genetic variation. Progress in this regard can be achieved through genecological exploration, followed by provenance testing to pinpoint useful, diverse or unique populations and their specific characteristics. These studies can be supported, when required, by the use of genetic markers to determine corresponding molecular level genetic variation.

In regard to (3), into which a large majority of forest tree species falls, the concept of "improvement for human use" is not usually applicable, and the continued existence of samples of populations of such species may be the only management objective. Species which are endemic or endangered at species or population level, but which are not of present-day social or economic value, will fall into this category.

In the case of categories (1) and (2), an indication should be given on whether the species is (i) indigenous; or (ii) introduced.

- Uses and attributes of target species

10. In the case of categories (1), (2), and when possible also (3), it is suggested that indication be given of the main actual or potential uses or attributes of priority (target) species:

- (ti) timber production;
- (po) posts, poles, roundwood;
- (pu) pulp and paper
- (wo) fuelwood, charcoal;
- (nw) non-wood products (gums, resins, oils, tannins, medicines, dyes...);
- (fo) food;
- (fd) fodder;
- (sh) shade, shelter;
- (ag) agroforestry systems;
- (co) soil and water conservation;
- (am) amenity, esthetic, ethical values;
- (xx) other (specify).

It would be desirable to have a balance of categories of species (1-3), covering a range of end uses (as per above) targeted for action by each country.

It is proposed to gather data regarding value and use (§9 and 10) in a table such as the following:

NAME of species	Value code	Present, future or potential use											
		ti	po	wo	nw	pu	fo	fd	sh	ag	co	am	xx
Acacia karroo	2				X			X					
Eucalyptus camaldulensis	1			X								X	
Faidherbia albida	1						X		X				
....													
....													
....													

*Table 1 : Value and use of target, important species, by country*

### Management and distribution target species

In order to prioritize among target species, information will be needed on their present occurrence, on-going programmes and projects in which they are included, and actual or potential threats to their genetic resources.

#### - Management and present location of genetic resources of target species

11. The following repositories of genetic resources should be considered:
  - (a) Protected Areas, National Parks (managed with the principle of full protection and minimum intervention by man), in which the target species is a component of a protected ecosystem;
  - (b) Conservation stands *in situ*, *ex situ* (managed for the explicit purpose of conservation of the genetic resources of the specified target species). In case of *ex situ* conservation stands, size, and number of provenances included in each separate stand should be specified.
  - (c) Forest Reserves, managed forests, in which special attention will be given to genetic conservation of target species in defined compartments. These include, naturally regenerated forests; and plantations (specify if local or introduced provenances used in plantations, if known);
  - (d) Village woodlots, farmers' fields, windbreaks, homesteads;
  - (e) Field experiments, selection and breeding programmes (specify number of provenances, families, clones).

In order to estimate present status, quantified information should be given in regard to the above, providing factual information (f) or estimates (e) of the number of individuals in each category, per major ecological zone (to be specified/ briefly described), as follows:

- < 100 individuals
- between 100 and 500 individuals
- between 500 and 1 000 individuals
- between 1 000 and 10 000 individuals
- > 10 000 individuals

Use could be made of a table similar to the one shown below when corresponding information is available. Figures indicate the number of trees in each category.

Species/area type	Reserve, national park	Stands <i>in situ</i> <i>ex situ</i>	Managed natural stands	Managed planted stands	Farmers' fields, homesteads	Experiments, field trials
Sp. 1, zone A	< 100					
Sp. 1, zone B					>500*	
Sp. 1, zone C		<i>Ex situ</i> 20				
Sp. 2, zone B			<1000*			
Sp. 2, zone D						5 provenances

\*: Estimated (non documented) number of trees

Table 2 : Management and location of genetic resources, by type of site and species



# Levels of security and threats to target species

12. Table 2 lists silvicultural management methods or regulations, with special reference to maintaining, conserving or enhancing the resources of given species or areas. Such relatively intensive management is likely to be restricted to a limited number of species and populations (for example, those included in tree improvement programmes). Generally, precise data is not available; in such cases, the intensity at which stands or populations are utilized can only be used as a basis for estimating general trends (variation in diversity and size of the resource).

Estimates should be given of the number of individuals in each category, per major ecological or geographic zone (to be specified/ briefly described), in the following use/management categories:

- (a) Protected (in Parks, Reserves);
- (b) Managed for Protective Purposes (watersheds, soil conservation, shade/shelter);
- (c) Managed for Productive Purposes (wood, non-wood products);
- (d) Managed for Grazing/ Browse;
- (e) Un-Managed Use and Harvesting;
- (f) Un-Managed Grazing/ Browse (domestic animals, wildlife);
- (g) Threatened by Wildfires, Biotic/Abiotic Factors (pests, diseases, floods, pollution);
- (h) Threatened by Clearing for Agriculture, Pasture;
- (i) Threatened by Overgrazing
- (j) Threatened by Infrastructure Development (dams, mining, urban expansion);
- (k) Other (specify).

Level of protection/security should be estimated or quantified on a scale of 1 to 5:

- 1: implementation / enforcement of regulations probable, and regulations scientifically sound (for use/management categories 4.a-4.d above); or threat mild/occasional (categories 4.e-4.j above);

2,3,4: intermediate between 1 and 5

- 5: implementation/ enforcement of regulations unlikely (categories 4.1-4.d); or threat severe with high probability of genetic degradation or loss (categories 4.e-4.j).

In Table 3, data regarding the level of security/management by species are shown:

Species by ecogeographic zone	(a)	(b)	(c)	(d)	(e)	(f)
	Protected in parks, protected areas	Managed for			Unmanaged	
		Soil,water protection	Wood, n/w goods	Grazing	Used for production	Used for grazing
Esp. 1 zone A			<100 trees			
Esp. 1 zone B	1000 trees					
Esp. 2 zone B	< 100				< 100	

(Table cont'd. on next page)

(Table cont'd. from previous page)

(g)	(h)	(i)	(j)	(k)	(l)
Threats and causes of loss of diversity					Overall Degree of Security
Environmental factors	Deforestation	Overgrazing	Development of infrastructure	Other reasons	
>1000 trees					1
		1000 trees			2
		< 100			5

*Table 3 : Degree of management and security of target species and populations*

- Synthesis : Identification of priority species

13. Based on the above evaluation, species in need of immediate action among the target species originally specified should be pin-pointed, reducing the original list to those in need of most urgent attention.

If, for example, a given target species occurs in large managed forest areas, in each major ecological zone specified, implying 1,000 to 10,000 individuals in each, and the enforcement of management is satisfactory, this target species- while it may be socially, economically and/or environmentally of top importance- will not be in need of immediate action; only monitoring of the situation, over time, will be needed.

If a given target species, while under some threat of depletion in parts of its range, is the focus of on-going selection and breeding activities, and occurs in seed stands, comprehensive clone banks and field trials in satisfactory numbers, again, the situation should be monitored but the species may not be of top priority in an action plan.

On the other hand, if the number of individuals in outlying populations of a given target species have been reduced to, say, <100, and the population is subject to un-managed grazing and firewood collection, serious consideration should be given for its inclusion in an intensive action programme to safeguard the genetic resources under threat through conservation, management and/or systematic inclusion of threatened populations and individuals in selection and breeding programmes.

### **Operational Needs in Priority Species**

14. Once the listing of possible target species has been narrowed down to focus on actual priority species (based on value, status and threats), operational needs should be specified. It is suggested that the following categories be used:

- (a) Taxonomic exploration;
- (b) Genecological exploration;
- (c) Collection of reproductive materials for testing;
- (d) Testing/evaluation (field trials at provenance, progeny, clonal levels);
- (e) Conservation and genetic management *in situ*;
- (f) Collection for conservation *ex situ*;
- (g) Conservation *ex situ*;
- (h) Selection and breeding;
- (i) Research on phenology, breeding systems, flowering/fruiting;
- (j) Research on silviculture, management.

Priority should be afforded to relevant operations, as applicable, on a proposed scale of 1-5:

- 1: Top priority, action should start with immediate effect;
- 2 to 4: Intermediate between 1 and 5.
- 5: Action should start within coming 10-year period.

As mentioned in §7, the lists regularly drawn up by the FAO Panel of Experts on Forest Gene Resources can potentially provide the format to be used for operational priorities.

## **APPENDIX 8**

### **FAO/IPGRI/ICRAF WORKSHOP ON THE CONSERVATION, MANAGEMENT, SUSTAINABLE UTILIZATION AND ENHANCEMENT OF FOREST GENETIC RESOURCES IN DRY-ZONE SUB-SAHARAN AFRICA**

This Appendix summarizes activities and outputs of a workshop held in Ouagadougou, Burkina Faso, in September 1998, to prepare a Sub-Regional Plan of Action on forest genetic resources in the Sahel.

The paper is based on a paper entitled "FAO/IPGRI/ICRAF Workshop on the Conservation, Management, Sustainable Utilization and Enhancement of Forest Genetic Resources in Dry-Zone Sub-Saharan Africa", published in Forest Genetic Resources No. 26 (1998).

Thirty-five participants took part in the above workshop held at the Centre National des Semences Forestières, Ouagadougou, Burkina Faso, 22 – 24 September 1998. National experts from 15 countries attended, as well as representatives from the organising institutions (FAO, in collaboration with IPGRI and ICRAF), and 6 other international, regional, bi-lateral and national agencies. The objective of the workshop was to assist countries in the Sahelian sub-region of Africa to assess the status of their forest genetic resources and to prepare a regional plan of action. During the workshop delegations presented reports on the national status of their forest genetic resources and discussed a draft synthesis report covering the sub-region (compiled beforehand on the basis of 12 individual national reports). Based on the discussions, a sub-regional plan of action on forest genetic resources was prepared and recommendations made for immediate follow-up and implementation.

#### **Background**

The Leipzig International Technical Conference on Plant Genetic Resources (June 1996) adopted a Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture. However, for a number of reasons, forestry was specifically excluded from this, 1996 version of the plan. As a first step toward developing a complementary Global Plan of Action on Forest Genetic Resources, and following recommendations made by the 13<sup>th</sup> Session of the Committee on Forestry (March 1997), which advises FAO on forestry issues, FAO initiated action to help plan and co-ordinate a series of regional and sub-regional workshops on forest genetic resources through a country-driven, collaborative process, carried out in close collaboration with national and international partners.

The overall goal of these workshops, on the management of forest genetic resources, including their conservation, enhancement and sustainable utilization, is the development of dynamic, country-driven and action-oriented regional and sub-regional plans. Plans are developed to help ensure that forest genetic resources are conserved and sustainably utilized as a basis for local and national development, providing food security, poverty alleviation, environmental conservation, economic and social advancement, and the maintenance of cultural and spiritual values. These action plans must be compatible with national, regional and international strategies in other sectors and areas which together contribute to overall sustainable development. Where they exist, national forest genetic conservation programmes will constitute the building blocks of regional and sub-regional action plans. It is therefore acknowledged that regional plans and programmes will vary according to national needs and priorities, as well as local biological, social and economic environments. The aim is not to develop one single model for conservation, but the elaboration of a framework for coordinated action at the sub-regional and regional levels that enhances and supports action at a national level. For background information, see Note FORGEN/99/5<sup>24</sup>.

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<sup>24</sup> See also FAO annual bulletin, Forest Genetic Resources No. 25, 1997, pp. 15-19.

### **The Ouagadougou Workshop**

In 1997 FAO, IPGRI and ICRAF joined forces to assist countries in the organization of a workshop on the conservation, sustainable utilization and enhancement of forest genetic resources in sub-Saharan dry-zone (Sahelian) Africa.

As a first step, two consultants from the sub-region (Mr. Bernard Kigomo, Kenya Forestry Research Institute and Mr. Albert Nikiéma, Centre National des Semences Forestières, Burkina Faso), were contacted to assist countries in collating available information on forest genetic resources. These consultants travelled to a total of 13 countries for direct discussions, between November 1997 and February 1998. The consultants covered (respectively): (i) six English-speaking countries of East and West Africa; and (ii) seven French-speaking West-African countries. Those countries which could not be visited were informed about the process, and were invited to contribute. The consultants made contacts with a range of interested parties in individual countries. Consultants also discussed the format and content of national reports, to ensure that they covered all aspects of forest genetic resources in a balanced manner, thus facilitating the subsequent elaboration of a regional synthesis. All countries concerned identified focal points for the elaboration of national reports to be presented at the workshop.

In preparation for the workshop, and based on the above, a third consultant (Mr. O. Eyog Matig, Cameroon, contracted by IPGRI in consultation with FAO), prepared a draft regional synthesis, based on the 12 country reports received by mid-August 1998.

Preceding the FAO/IPGRI/ICRAF workshop, in March 1998, IPGRI, in collaboration with FAO, the Danida Forest Seed Centre, CIRAD-Forêt and other partners, organized a regional training course on the conservation and sustainable use of forest genetic resources for French-speaking countries of western and central Africa and Madagascar. Several national focal points from the above process were present. The training course, the first of its kind in the region, covered all fields related to forest genetic resources and emphasized the need for country-driven concerted action at national and regional levels<sup>25</sup>.

The workshop on the conservation, sustainable utilization and enhancement of forest genetic resources in sub-Saharan dry-zone (Sahelian) Africa was held at the Centre National de Semences Forestières, Ouagadougou, Burkina Faso, 22 – 24 September 1998. The stated objectives of the workshop were to assist countries in the Sahelian sub-region to assess the status of their forest genetic resources, elaborate and propose priority actions, and make recommendations for immediate follow-up and implementation.

Thirty-five participants took part in the workshop, with national experts from 15 countries<sup>26</sup>, as well as representatives from the organizing institutions (FAO in collaboration with IPGRI and ICRAF) and 6 other international, regional, bilateral and national agencies (CIRAD-Forêt, Danida Forest Seed Centre, IRAD-Cameroon, UNEP, IUCN and IUFRO). National experts presented country reports summarizing the status of forest genetic resources, indicating priority species, listing key issues and providing recommendations to confront the major constraints identified. A draft regional synthesis was presented, discussed and adjusted in the light of the discussions. Experts identified the need for, and agreed to prepare, a sub-regional Plan of Action on forest genetic resources, for which

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<sup>25</sup> Participants at this training course recommended the development of a regional research programme for forest genetic resources in Sub-Saharan Dry-Zone Africa (SAFORGEN), initially composed of four pilot networks, namely: fruit and food tree species; fodder tree species; African timber and wood species; and African non-timber forest products. It was recommended that IPGRI facilitate the development of this research-related programme in collaboration with FAO, ICRAF and other participating regional and international organizations.

<sup>26</sup> Benin, Burkina Faso, Cameroon, Chad, Côte d'Ivoire, Eritrea, The Gambia, Guinea, Kenya, Mali, Mauritania, Niger, Senegal, Sudan and Togo.

the following three main objectives were specified, with related activities (the main points are underlined):

1. Improved management and utilization of forest genetic resources.

Resource assessment

Conservation, including protection

Sustainable utilization

2. Enhancement of availability of superior germplasm

Seed supply and demand

Selection and improvement of priority species

3. Enhancement of institutional capacity

Awareness raising

Institutional strengthening

Training

Exchange of experience, know how and information.

The national experts recommended that FAO, in collaboration with IPGRI, ICRAF, and other international, regional, bilateral and national partners, should: (a) finalize the synthesis report on the state of forest genetic resources in the Sahelian sub-region of Africa, (b) finalize the sub-regional Plan of Action on forest genetic resources prepared by the meeting, (c) promote the implementation of the sub-regional Plan of Action through appropriate mechanisms; and (d) facilitate the organization of similar action-oriented, country-driven workshops in other sub-regions of Africa.

Experts recommended the establishment of a regional research oriented programme for forest genetic resources in Sub-Saharan Africa and expressed their willingness to take part in such a regional mechanism which could act as a focal point for future action. Participants indicated high expectations of IPGRI's new Sub-Saharan Africa Forest Genetic Resources Programme (SAFORGEN) as an implementing mechanism. A satellite meeting was held to discuss the scope, objectives, functioning and funding of SAFORGEN. When operational, the programme would be a useful platform to carry out several of the research activities listed in the sub-Regional Plan of Action on forest genetic resources for the Sahel.

A reference document, incorporating the synthesis report, the sub-Regional Plan of Action and the recommendations of the workshop, is currently being finalized by FAO in collaboration with IPGRI and ICRAF (FAO 1999).

## **APPENDIX 9**

### **PACIFIC SUB-REGIONAL WORKSHOP ON FOREST AND TREE GENETIC RESOURCES**

This Appendix summarizes activities and outputs of the FAO/SPRIG/AusAID/SPREP/SPC-PIF&TSP/Samoa Forestry Division Workshop held in Samoa in April 1999 to prepare a sub-Regional Action Plan on forest and tree genetic resources for the Pacific Islands.

#### **Background and Organization**

The Pacific Sub-Regional Workshop on Forest and Tree Genetic Resources was held in Apia, Samoa, from 12 to 16 April 1999. This meeting formed part of a series of workshops facilitated by FAO to assist countries and territories in the preparation of regional action plans on forest tree genetic resources, following the recommendations of 13<sup>th</sup> Session of the Committee on Forestry (March 1997). The meeting, the first of its kind in Oceania, was strongly supported by Heads of Forestry of the Pacific Islands. Invitations to the workshop were sent by the Secretariat of the Pacific Community to 22 Heads of Forestry, to international, regional and bilateral organizations interested in the field of forest genetic resources, and to a number of resource persons.

The major workshop sponsors and members of the Organising Committee were the South Pacific Regional Initiative on Forest Genetic Resources (SPRIG) and the Australian Agency for International Development (AusAID), the FAO Forestry Department and FAO Sub-Regional Office, the Pacific Island Forests & Trees Support Programme of the Secretariat of the Pacific Community (SPC/PIF&TSP), the South Pacific Regional Environment Programme (SPREP), the Forestry Division, Ministry of Agriculture, Forests, Fisheries and Meteorology, Samoa. Additional support was provided by other regional and international organizations including IPGRI, ACIAR and the Pacific German Regional Forestry Project.

#### **Attendance**

The meeting was attended by 60 participants from 18 countries and territories and 10 international, regional or national organizations and corporations. The following islands were represented: American Samoa, Cook Islands, Fiji, Federated States of Micronesia, French Polynesia, Guam, Hawaii, Kiribati, Marshall Islands, Nauru, New Caledonia, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Vanuatu and Wallis and Futuna. In addition to the organizers, the following international, regional, bilateral and national organizations and corporations were present: CIRAD-Forêt, CSIRO, the FAO FORSPA project, Fiji Hardwood Corporation Ltd, Pacific German Regional Forestry Project, IUFRO, QFRI, University of the South Pacific, and USDA-Forest Service. Apologies were received from Northern Marianas, Tonga, Tuvalu, the Secretariat of the Convention on Biological Diversity (CBD) and CIFOR. Officers from several national authorities of Samoa attended parts of the meeting.

#### **Working Sessions**

The international context in forest genetic resources and the aims and goals of the workshop were presented by Mr Pierre Sigaud (FAO Forestry Department, Rome). Forestry matters and genetic resources have received increased attention in the past decade. Although no truly global mechanism is yet available, several regionally-based initiatives on forest genetic resources have proved successful in framing coordinated strategies and in fostering action at national level.

Representatives from countries and territories gave summary accounts of their reports on the status of forest genetic resources at national level. Participants reported on the diversity of values and functions traditionally attached to forests and trees. They also stressed that heavy pressures on forests and woodlands were leading to an overall loss of resources and the biological diversity and genetic resources they contained. In several islands, there was an urgent need for targeted conservation measures. In addition to technical considerations, the need to address land tenure issues and involving local populations were reported as being crucial factors in sustainable forest management. Wide-ranging issues common to several countries and territories, and opportunities for exchange of experience and know-how, were identified.

Participants from international, regional and bilateral organizations, including CIRAD-Forêt, CSIRO, FAO, IPGRI, SPC/GTZ/Pacific-German Regional Forestry Project, SPC/PIF&TSP, SPC/Plant Protection Service, SPREP, SPRIG and USDA-Forest Service, and representatives from NGOs and the University of the South Pacific (USP), provided information on the work carried out by their respective agencies in the field of forestry and forest genetic resources in the region.

The following session was introduced by an overview of the workshop process. Four thematic areas were proposed for discussions and incorporation in the regional action plan, *viz.* prioritization of species and operational needs; ways to support sustainable utilization and management of forest and tree resources; issues related to germplasm exchange and access; and institutional strengthening and training. Participants were sub-divided into three eco-geographic working groups covering Polynesia and Eastern Pacific (American Samoa, Cook Islands, French Polynesia, Niue, Samoa and Wallis & Futuna); Melanesia (Fiji, New Caledonia, Papua New Guinea, Solomon Islands and Vanuatu) and Micronesia/Central Oceania (Guam, Hawaii, Kiribati, Marshall Islands, FRS. Micronesia, Nauru, and Palau).

The relevance of a species approach, suggested as an entry point to the action plan, was debated and subsequently endorsed. It was recognized that such a strategy, based on an utilitarian approach to the identification of priority species and tree populations, could help focus discussions on operational needs and requirements. In addition, it complemented other conservation strategies based on an ecosystem approach to management of forest resources and biological diversity presently being addressed in other fora.

#### Theme 1: Identification of priority species and activities

Based on information provided by participants or gathered from country reports prepared beforehand, ten top priority native species and ten high priority native species were identified by each eco-regional working group. Priority genera and species consisted of (i) those common to all islands (*Cordia subcordata*, *Calophyllum* *ssp.*, *Intsia bijuga* and *Terminalia* *ssp.*); (ii) those common to Melanesia and Polynesia (*Diospyros* *ssp.*, *Pometia pinnata*, *Santalum* *ssp.* and *Syzigium* *ssp.*), (iii) those specific to a given sub-region (such as *Agathis* and *Araucaria* in Melanesia, *Thespesia populnea* in Micronesia, and *Morinda citrifolia* in Polynesia). *Pinus caribaea* and *Swietenia macrophylla* were cited as the most important introduced species in Melanesia and Polynesia. The lists will be validated and complemented, for each species, by a scoring of technical activities most urgently needed (including exploration and collection of germplasm, evaluation, improvement, conservation *in situ* and *ex situ*).



Theme 2: Sustainable utilization and management of forests and trees; conservation (protected) areas; traditional conservation measures.

The work of USP and other regional organizations in the assessment of arboreal species diversity, and the prospects for the sustainable provision of goods and services through community-based, participatory management, were presented. Participants then debated in three working groups about action recommended to promote and implement sustainable forest management practices for ecosystems and priority tree species. Participants acknowledged the need for a multidisciplinary approach and recognized the compatibility of conservation (including *in situ* and *ex situ* strategies) and sustainable utilization. The traditional role of local communities through customary regulation systems in the protection and conservation of forest trees was emphasized, although in some cases land tenure issues had inhibited centralized conservation efforts. Specific strategies for the coordination of action on priority tree species should vary according to the ranking of each species and its geographical coverage, from regional collaboration projects to national or local undertakings.

Theme 3: Germplasm exchange and access

Several viewpoints were presented on the complexity of the issue relating to access and exchange of germplasm, both within countries and among countries, was presented through several viewpoints. Forest genetic resources are included in the provisions of the Convention on Biological Diversity and other international agreements. In addition to legal considerations, issues concerning the sharing of benefits derived from the use of genetic resources; quarantine and plant protection regulations; and invasive species, were presented and debated. Participants recognized that free exchange of forest germplasm within and between countries is of vital importance. The experience of SPRIG, which has developed an internal Code of Conduct for Access and Transfer of Forest Genetic Materials, and the CGIAR Ethical Principles Relating to Genetic Resources, were recommended to be used for the development of regional agreements which should be based on mutually agreed terms, compatible with national laws.

Theme 4: Institutional strengthening and training

A number of collaborative programmes, projects and initiatives on forestry, forest conservation and forest genetic resources already exist in the Pacific Region. These have proved effective in enhancing national strategies and activities. Participants recognized that such efforts should be continued and further expanded. In particular, national and regional capacities should be strengthened by an appropriate balance of university training and “hands-on” sharing of technical skills and experience. Priority subjects were identified for training at field and university levels. Considering the limited number of research organizations involved in the management of forest genetic resources in the region, participants emphasized the importance of sharing experiences, skills and information through formal networking and linkages. On policy matters, participants recognized the need to raise awareness at all levels on the importance of forestry issues in general, and the management of forest genetic resources, including their conservation, in particular.

The last day of the workshop was devoted to discussing the outlines of the draft plan of action, which was based on the conclusions of the working groups. The main chapters of the action plan (overview of the current status of forest biological diversity and genetic resources; identification of opportunities; strategy and guidelines; recommendations on *in situ* and *ex situ* conservation; sustainable use and management; research needs; capacity building and policy issues; and monitoring of developments) were adopted in principle. It was agreed that the detailed elements of the plan of action would be completed later by SPRIG and FAO, in close collaboration with rapporteurs, and circulated to all participants for comments.

### **Conclusions and immediate follow-up action**

The workshop provided a forum for discussion of key issues related to forest genetic resources in the region. The participants recognized the need for, and agreed to develop, a regional action plan for the conservation and sustainable use of forest and tree genetic resources in the Pacific. A draft based on the workshop discussions will be circulated to participants by the Organizing Committee, and the final document will be finalized within 1999. The plan will be complemented by a synthesis of the status of forest genetic resources in the Pacific islands, based on data available in country reports. The synthesis and the action plan will be widely disseminated to institutions and organizations inside and outside of the region. These publications will be complemented by the proceedings of the workshop, detailing country and territory reports and other workshop reports and papers of relevance.

Information on the workshop and its outputs and documentation will be provided to other fora and meetings. It is planned to make information available on-line through the world-wide FAO Information System on Forest Genetic Resources (REFORGEN), the SPRIG Regional Data Base of Forest Genetic Resources, and the Clearing House Mechanism of the Convention on Biological Diversity.

### **List of Acronyms**

AusAID: Australian Agency for International Development, Canberra, Australia  
CGIAR: Consultative Group on International Agronomic Research, Washington, USA  
CIFOR: Centre for International Forestry Research, Jakarta, Indonesia  
CIRAD-Forêt: Département forestier du Centre international en recherche agronomique pour le développement, Nouméa, New Caledonia  
CSIRO: Commonwealth Scientific and Industrial Research Organization, Canberra, Australia  
FAO: Food and Agriculture Organization of the United Nations, Rome, Italy  
FORSPA: Forestry Research Support Programme for Asia and the Pacific, Bangkok, Thailand  
IPGRI: International Plant Genetic Resources Institute, Rome, Italy  
IUFRO: International Union of Forestry Research Organizations, Wien, Austria  
MAFFM: Ministry of Agriculture, Forests, Fisheries and Meteorology, Apia, Samoa  
NGO: Non-Governmental Organization  
PGRFP: Pacific German Regional Forestry Project, Suva, Fiji  
PIF&TSP: Pacific Islands Forests & Trees Support Programme, Suva, Fiji  
QFRI: Queensland Forestry Research Institute, Department of Primary Industries, Gympie, Australia  
SAPA: FAO Sub-regional Office for the Pacific Islands, Apia, Samoa  
SPC: Secretariat of the Pacific Community, Nouméa, New Caledonia  
SPREP: South Pacific Regional Environment Programme, Apia, Samoa  
SPRIG: South Pacific Regional Initiative on Forest Genetic Resources, Australia  
USDA-FS: United States Department of Agriculture, Forest Service, Pacific Southwest Research Station, Albany, USA  
USP: University of the South Pacific, Suva, Fiji

## **APPENDIX 10**

### **INFORMATION ACTIVITIES**

#### **Introduction**

In line with FAO's mandate and following the recommendations of the most recent Sessions of the Panel of Experts on Forest Gene Resources, the Forest Resources Division of FAO gives high priority to the collection, analysis and dissemination of information on forest genetic resources. Main focus of the present note is on the development of the FAO forest genetic resources Homepage, the publication of the annual bulletin "Forest Genetic Resources" and the development of REFORGEN - the FAO World-Wide Information System on Forest Genetic Resources. It should however also be noted that a number of technical guides, reviews, papers and documents in the "Forestry Paper" series have been published over the past years. Forestry Department "Information Notes" provide a brief introduction to work covered, including forest genetic resources. The notes are all available in printed form and on the FAO Homepage in English, French and Spanish<sup>27</sup>.

#### **FAO Forest Genetic Resources Homepage**

The FAO Homepage on forest genetic resources was launched in 1997 and has since then been gradually expanded to cover a broad range of issues and information on all FAO's activities in the field of forest genetic resources. The site contains links to a number of related sites hosted by other organizations active in the field of forest genetic resources thus facilitating access to a large amount of information. Recent issues of the annual bulletin "Forest Genetic Resources" (from 1995 onwards) are available on the Homepage as well as Reports on the Forest Gene Panel Sessions. All information is now available in English, French and Spanish. As a response to the improved presence on the Internet, FAO is receiving an increasing amount of requests for additional information from visitors to the forest genetic resources Homepage. Requests originate from a broad audience including farmers and students, researchers and project managers. Future plans include regular updating of the Homepage and its expansion to include technical publications (notably Forestry Papers and technical guides) and access to the information in REFORGEN (see below).

#### **"Forest Genetic Resources" Bulletin**

In 1973 FAO started publishing the bulletin "Forest Genetic Resources [Information]", first in three issues per biennium, presently annually. The bulletin is published in a total of 3800 copies in English, French and Spanish, and contains a selection of papers representing a wide coverage of technical forest genetic resources issues and geographical/eco-geographical situations. In addition to the technical papers each issue contains a number of short notes summarizing interesting activities and highlighting recent literature of interest. Forest Genetic Resources targets a broad audience including geneticists, researchers, government Forest Services and project managers and is presently distributed to readers in 167 different countries.

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<sup>27</sup>Including: (i) Regional Strategies and Action Plans on Forest Genetic Resources; (ii) Management of Forest Genetic Resources: their conservation, enhancement and sustainable utilization; (iii) Panel of Experts on Forest Gene Resources. A number of other Forestry Department Information Notes, found on <http://www.fao.org/WAICENT/FAOINFO/FORESTRY/infonote/default.htm> are also of relevance to the forest genetic resources field.

## **REFORGEN: the FAO World Wide Information System on Forest Genetic Resources**

The development of REFORGEN was requested by the international community and national institutes especially in developing countries to fill an identified gap in information. Work in this field has been endorsed by FAO Statutory and Governing Bodies, and is in line with areas of action prioritized at Organizational level.

The overall objective of REFORGEN is to make available reliable and up-to-date information on forest genetic resources activities for use in planning and decision making at national, sub-regional, regional and international levels.

The specific objectives are:

- to summarize, at national level, the status of forest genetic resources;
- to describe, at national level, the main activities related to forest genetic resources;
- to help identify gaps in current activities at sub-regional, regional and international levels; and thus
- to highlight areas of potential collaboration, to strengthen action and impact;
- to facilitate decision-making on forest genetic resources priorities at sub-regional, regional and international levels.

At present, a rather simple system has been developed, covering a limited number of key parameters related to the conservation, enhancement and utilization of forest genetic resources. It is the intention, resources permitting, to gradually expand the system to a wider range of parameters in close collaboration and consultation with the participating countries, based on the results and experiences gained in the initial phase.

### **Information in the system**

The information in the system can be divided into two major groups: (i) information **by species** on status and activities in the field of forest genetic resources in a given country, (ii) information **on organizations** active in the field of forest genetic resources in a given country. All information in the system is aggregated at the species and at the country (national) level.

### **Species information**

Information on activities related to the conservation, enhancement and utilization of forest genetic resources, by species in each country, constitutes the core information in REFORGEN.

REFORGEN contains species information related to the following categories of information:

1. species, native or introduced;
2. management of the species (in natural forests and/or in plantations);
3. main uses of the species;
4. status and main threats, if endangered or threatened;
5. *in situ* conservation activities including details about conservation areas;
6. *ex situ* conservation activities *in vivo* and *in vitro*;
7. tree improvement activities; and
8. availability of reproductive material.

Annex I gives an example of typical information held for each individual species in the system, and describes in more detail the different categories of information.

## **Organizational information**

Information on the organizations (including *e.g.* Government Departments, research organizations, private companies and other non-governmental organizations) active in the field of conservation and utilization of forest genetic resources in the country, constitute the second major component in REFORGEN.

Information recorded comprises:

1. name of institution;
2. address, telephone, fax numbers, e-mail address;
3. names of contact persons in the organization;
4. type of organization and
5. main activities of the organization.

## **Information sources**

The core data in REFORGEN was provided by the FAO member countries through replies to a questionnaire on forest genetic resources, originally despatched in March 1993 to all Heads of National Forest Services. The questionnaire invited Heads of National Forest Services to contact and consult concerned national institutions and agencies, including other governmental bodies, research institutes, universities, the private sector and other relevant NGOs. To ensure as complete a response as possible, FAO's Forestry Department furthermore despatched copies of the questionnaire to individual contacts in a range of countries, drawing their attention to the enquiry underway, asking them to provide data through the National Forest Service. The information provided through replies to the questionnaires has been complemented by information submitted by countries in the preparation of the Fourth International Technical Conference on Plant Genetic Resources held in Leipzig, Germany, June 1996.

In addition, information is being complemented by data from Country Reports on the status of conservation, enhancement and utilization of forest genetic resources, compiled by countries in the preparatory process of a series of regional and sub-regional workshops on forest genetic resources supported by FAO (see Note FORGEN/99/5, 99/6 and 99/7). Additional relevant information is extracted from reliable publications, FAO field programme activities, travel reports etc.

As of March 1999, REFORGEN includes information on forest genetic resources activities in 146 countries (Table 1) related to more than 1600 tree species. The amount of available information is fairly well distributed between regions and between developed/developing countries. There are however large differences from different countries in the amount of information at present available in the system, ranging from limited information on a few national priority forest tree species for some countries, to detailed information on a wide range of species and activities for other countries.

## **Maintaining and updating REFORGEN**

Having reliable data in the information system is of crucial importance, and efforts to secure a high degree of data reliability receive high priority.

The task of maintaining and regularly updating reliable information is complicated by the many and different types of organizations active in the field of forest genetic resources in many countries and general lack of national level coordination between them. It is further complicated by the different governmental tiers of activity, *e.g.* local, provincial, state and national levels. The REFORGEN information has been gathered through "National Focal Point" organizations (in most cases the national Forest Department/Forest Service), which have been requested to contact and consult other actors in the field and to prepare a coordinated reply. As mentioned above, such comprehensive information is not readily available in many countries and has often not been compiled by respondents. As a consequence,

FAO has received uncoordinated information from more than one organization, for a number of countries, and for others the information at present in the system is unlikely to be a fair representation of the total amount of forest genetic resources activities in the country due to lack of comprehensive information from national actors. These shortcomings underline the importance of regular revision of information available in REFORGEN by countries concerned.

The process of revision and updating of the information by countries has been initiated; information presently in the system is being sent to a number of individual countries for confirmation, revision and up-dating. Request for revision of available data, which is planned to be done region by region, has been started in the Near-East region, and will gradually be expanded to cover other regions and countries. This activity will have to be repeated at regular intervals.

### **Making the information available**

In addition to giving high priority to maintaining reliable and up-to-date information in REFORGEN, efforts will be made to make the information readily available.

The system has been developed to produce a number of pre-defined and user-friendly reports and summary reports. Annex 2 gives an example of a typical summary report. In addition, more specific queries can be processed if necessary.

The information in REFORGEN is presently available to countries "on request". Once the system is in full operation, information will be placed on the Internet. The Internet version of REFORGEN, which is presently being developed, will allow users to submit a number of pre-defined queries to the system, from all computers with access to the Internet. The Internet version is planned to be placed on the FAO forest genetic resources Homepage before January 2000. In addition availability of the information on CD ROM is under consideration.

### **Conclusions**

The world-wide information system on forest genetic resources, REFORGEN, has been developed by FAO at the request of member countries and the international community for use by national institutions which, at the same time, are the providers of the information in the system. REFORGEN is a tool whose value very much depends on the collaboration of its users to regularly revise, up-date and improve information contained in it.

REFORGEN should be seen as a basic system, covering a limited number of key parameters of importance for decision-making and planning in forest genetic resources activities and programmes. The objective has not been - and will not be in the future - to develop a system with very detailed information at the national, local or single-organization level; this is the task of complementary national database systems. Information contained in such national databases and information systems form the components of the aggregated regional/eco-regional and more international level information in REFORGEN.

<b>AFRICA</b>		
Angola (CR)		
Benin (Q, CR)		
Botswana (CR)		
Burkina Faso (Q)		
Cameroon (Q, CR)		
Cape Verde (CR)		
Central African Republic (CR)		
Chad (Q)		
Congo (CR)		
Cote d'Ivoire (Q, CR)		
Ethiopia (CR)		
Gabon (Q, CR)		
Gambia (CR)		
Ghana (CR)		
Guinea (CR)		
Kenya (Q, CR)		
Lesotho (CR)		
Liberia (Q)		
Madagascar (Q, CR)		
Malawi (Q)		
Mauritius (Q, CR)		
Mozambique (CR)		
Namibia (Q, CR)		
Niger (Q, CR)		
Nigeria (Q, CR)		
Rwanda (CR)		
Senegal (Q, CR)		
Seychelles (CR)		
Sierra Leone (CR)		
South Africa (CR)		
Sudan (CR)		
Swaziland (CR)		
Tanzania (Q, CR)		
Togo (CR)		
Uganda (Q, CR)		
Zaire (CR)		
Zambia (CR)		
Zimbabwe (Q, CR)		
<b>ASIA-PACIFIC</b>		
Australia (Q)		
Bangladesh (Q, CR)		
Bhutan (Q)		
Cambodia (Q, CR)		
China (Q)		
Cook Islands (CR)		
Fiji (Q)		
India (Q, CR)		
Japan (Q, CR)		
Korea, Republic of (Q, CR)		
Malaysia (Q, CR)		
Maldives (CR)		
Mongolia (CR)		
Myanmar (Q)		
Nepal (Q, CR)		
Niue (CR)		
Philippines (CR)		
Samoa (Q)		
Solomon Islands (Q, CR)		
Taiwan (Q)		
Thailand (Q, CR)		
Viet Nam (Q, CR)		
<b>EUROPE</b>		
Albania (CR)		
Austria (Q, CR)		
Belgium (Q, CR)		
Bulgaria (Q, CR)		
Cyprus (Q)		
Czech Republic (Q, CR)		
Denmark (Q, CR)		
Estonia (Q, CR)		
Finland (Q, CR)		
France (Q, CR)		
Germany (Q, CR)		
Greece (Q, CR)		
Hungary (Q, CR)		
Iceland (CR)		
Ireland (CR)		
Israel (Q, CR)		
Italy (CR)		
Latvia (Q, CR)		
Lithuania (Q, CR)		
Luxembourg (Q)		
Malta (Q)		
Moldova, Republic of (CR)		
Netherlands (Q, CR)		
Norway (Q, CR)		
Poland (CR)		
Portugal (CR)		
Romania (Q, CR)		
Russian Federation (Q)		
Slovak Republic (CR)		
Slovenia (CR)		
Spain (CR)		
Sweden (Q, CR)		
Switzerland (Q, CR)		
Ukraine (CR)		
United Kingdom (Q, CR)		
Yugoslavia, Fr. Rep. Of (CR)		
<b>LATIN AMERICA AND THE CARIBBEAN</b>		
Argentina (CR)		
Bahamas (CR)		
Bolivia (Q, CR)		
Brazil (Q, CR)		
Chile (Q, CR)		
Columbia (Q)		
Costa Rica (Q, CR)		
Cuba (Q, CR)		
Dominica (Q, CR)		
Dominican Republic (CR)		
Ecuador (Q, CR)		
El Salvador (Q, CR)		
Grenada (CR)		
Guatemala (CR)		
Guyana (CR)		
Honduras (Q, CR)		
Jamaica (CR)		
Nicaragua (Q, CR)		
Panama (Q, CR)		
Paraguay (CR)		
Peru (Q, CR)		
Saint Lucia (CR)		
Trinidad and Tobago (CR)		
Uruguay (Q, CR)		
Venezuela (CR)		
<b>NEAR EAST</b>		
Afghanistan (Q)		
Algeria (Q, CR)		
Armenia (CR)		
Azerbaijan (CR)		
Egypt (Q, CR)		
Iran (CR)		
Iraq (CR)		
Jordan (Q, CR)		
Lebanon (Q, CR)		
Morocco (Q, CR)		
Pakistan (Q, CR)		
Saudi Arabia (CR)		
Sudan (CR)		
Syrian Arab Republic (CR)		
Tunisia (Q, CR)		
Turkey (Q, CR)		
Yemen, Republic of (CR)		
<b>NORTH AMERICA</b>		
Canada (Q, CR)		
Mexico (Q, CR)		
United States of America (Q)		

Table 1. List of countries with information available in the REFORGEN information system as of March 1999. Countries grouped according to FAO regions. The main source of information is indicated in brackets behind the country name; Q: Information from Questionnaire on forest genetic resources sent out by the FAO Forestry Department, CR: Information from Country Report submitted for the 4th Intl. Tech. Conf. on Plant Genetic Resources.

APPENDIX 10, Annex I

**REFORGEN: FAO WORLD WIDE INFORMATION SYSTEM ON  
FOREST GENETIC RESOURCES**

15-Sept-99

**REPORT OF SPECIFIC SPECIES BY SPECIFIC COUNTRY**

**Species:**

---

**Species Information for:**

---

**Source of Information:**

**Last update:  
Taxonomic Code:**

---

*Utilization*

*Species Management*

*Species Use*

**Managed:  
Origin:  
Importance:  
(1-9)**

**Timber:  
Pulp:  
Fuel:  
NWFP:**

**Memo:**

---

*Endangered Status*

*Level*

*Cause*

**Species:  
Population:**

**Deforestation:  
Overexploitation:**

**Pest:  
Disease:  
Other:**

**Memo:**

---

*In Situ Conservation*

*Conserved*

*Size of Program Area*

**In protected areas:  
In managed forests:**

**Number of Stands:  
Total Area (ha):**

**Memo:**



***Ex Situ Conservation***

***In vitro***

<b>Seed:</b>	<b>Number of Seed Lots:</b>
<b>Pollen:</b>	<b>Number of Pollen Lots:</b>
<b>Tissue:</b>	<b>Number of Accessions:</b>

***In vivo***

<b>Stands:</b>	<b>Number of Stands:</b>
	<b>Number of Provenances:</b>

**Total area of stands:**

**Memo:**

---

***Tree Improvement***

<b><i>Trials</i></b>	<b><i>Number of Provenance Trials:</i></b>	<b><i>Number of Provenances tested:</i></b>
	<b><i>Number of Progeny Trials:</i></b>	<b><i>Number of Progenies tested:</i></b>
	<b><i>Number of Clonal Trials:</i></b>	<b><i>Number of Clones tested:</i></b>

***Orchards***

***Number of Clones in CSO:***  
***Number of Families in SSO:***  
***Total Orchard Area (ha):***

***Archives (accessions)***

***Total No. Of Clones Archived:***  
***Total No. Plus Trees:***

**Memo:**

---

***Reproductive Material Available***

<b>Identified:</b>	<b>F1:</b>
<b>Selected:</b>	<b>Tissue:</b>
<b>Seed Orchard:</b>	<b>Scion:</b>

**Memo:**

**APPENDIX 10, Annex II**



**REFORGEN: FAO WORLD WIDE INFORMATION SYSTEM ON FOREST GENETIC RESOURCES**

14-Sep-99

Forestry Department  
Forest Resources Division  
Viale delle Terme di Caracalla  
00100 Rome, Italy  
Email: forest-genetic-resources@fao.org  
Fax: +39 06 570 55 137

**REFORGEN SPECIES PROFILE FOR:**

**Bombacopsis      quinata      (No Subspecies)**

Country	Native 1	Plantations 2	Natural 3	Endangered species 4	Endangered populations 5	<i>In situ</i> 6	<i>Ex situ</i> 7	Improvement 8
Colombia	X	X	X					X
Costa Rica	X	X	X					X
Honduras	X	X	X		X		X	X
Nicaragua	X	X	X		X			X
Panama	X	X	X		X			
Venezuela	X	X						
<b>TOTAL</b>	<b>6</b>	<b>6</b>	<b>5</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>4</b>

**KEY**

- 1 Species reported native to the country
- 2 Species managed in plantations
- 3 Species managed in natural stands
- 4 Endangered at species level

- 5 Species endangered at population level
- 6 Activities in in-situ conservation reported
- 7 Activities in ex-situ conservation reported
- 8 Activities in tree improvement reported

< 1 >

**APPENDIX 11**

**FOREST GENETIC RESOURCES PRIORITIES  
(BY REGION, SPECIES AND OPERATION)**

**SPECIES IDENTIFIED AS TOP PRIORITY  
FOR FAO COORDINATED ACTIVITIES**

**NOTES**

**(i) General Observations**

The present Appendix, complemented by Appendix 12, represents an attempt to provide a list of top priority forest tree species at regional, eco-regional or sub-regional level.

The list does not present an exhaustive list of woody perennial species in need of attention. It aims at providing information on those species and provenances which the FAO Panel of Experts on Forest Gene Resources, during its 11th Session in September/October 1999, considered should be given highest priority **in the forest genetic resources programme of FAO's Forestry Department.**

The Panel of Experts recognized that many of the priority ratings must be considered tentative; the list will need continuing up-dating and must be modified in the light of new information, knowledge and needs.

The list is based on the experts' opinion. The diversity of forest types, status and condition, and the different types and scales of values used to rank forest tree species among countries and cultures, make the establishment of objective, global guidelines, a difficult exercise. In their own capacity, and on the basis of their personal experience, experts have reviewed information from national and regional sources, and ranked those species which appeared to present the highest **actual or potential value, at species or population level<sup>28</sup>**.

The present list should be reviewed in conjunction with the more detailed and complete lists of national, regional and global priority species and activities, shown in Appendix 12. There is, furthermore, a need to supplement both lists drawn up by the Panel with more detailed, national lists of priorities at local and national level.

This list emphasizes the importance of the genetic variation between species, and within species, and does not specifically target endangered or threatened species or populations because of their endangered condition. Similarly, although in exceptional cases referring to genera, the list does not refer to ecosystems or biota.

Readers interested in endangered or threatened tree and shrub species may wish to refer to:

- (i) the *2000 IUCN Red List of Threatened Species*, at <http://www.redlist.org/>;
- (ii) the *World List of Threatened Trees*, by S. Oldsfield, C. Lusty and A. MacKinnon, World Conservation Press, Cambridge, 1998;
- (iii) the *World Conservation Monitoring Centre's Tree Conservation Database*, available on Internet at: [http://www.wcmc.org.uk/cgi-bin/SaCGI.cgi/trees.exe?FNC=database\\_Aindex\\_html](http://www.wcmc.org.uk/cgi-bin/SaCGI.cgi/trees.exe?FNC=database_Aindex_html)

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<sup>28</sup>A more elaborated priority setting process, used to draw lists for the Pacific Islands is described in Appendix 7

(ii) **Legend**

A fold-out flap on the inside of the back cover summarizes the indications given below.

**"End Use of Species" (columns 1-4)**

Column 1, "*Industrial Wood*": sawn logs, timber, heavy construction wood, plywood, chip and particle board, wood pulp.

Column 2, "*Industrial Non-Wood Products*": gums, resins, oils, tannins or other products used in small, medium and large-scale local and non-local industries.

Column 3, "*Fuelwood, Posts, Poles*": firewood and wood used for the production of charcoal and energy; roundwood used on-farm.

Column 4, "*Other Uses (goods, services)*": food, fodder, land stabilization, soil amelioration, shade, shelter and other environmental and cultural or religious values.

**"Operations/Activities"**

The list indicates priority on a scale from 1 to 3 for the various operational steps identified: exploration, evaluation, conservation and utilization of germplasm (including selection and breeding) as follows:

- (1) Highest priority
- (2) Prompt action recommended
- (3) Action is important, but of less urgency than that for species listed as priority (1) and (2).

**"Remarks" column**

PVT = provenance trials  
PGT = progeny trials  
CLT = clonal trials  
SO = seed orchard  
(E) = endangered at species or provenance level  
MPTS = multi purpose tree species

The fold-out flap on the inside of the back cover recalls the indications given above.

**LIST OF SPECIES IDENTIFIED AS TOP PRIORITY**  
**FOR FAO COORDINATED ACTIVITIES**

1. Western USA/Canada.....	64
2. Eastern USA/Canada .....	64
3. Mexico.....	64
4. Caribbean, Central America, Colombia, Venezuela and Ecuador.....	64
5. South America (except Colombia, Venezuela and Ecuador) .....	64
6. Northern and Central Europe.....	65
7. Mediterranean Region, Southern Europe and Near East.....	65
8. South and East Asia (excl. China and India).....	65
9. North, North-East and Central Asia (incl. China, Dem. People's Rep. of Korea, India, Japan, Mongolia and Rep. of Korea).....	65
10. Africa.....	66
11. Australia and New Zealand .....	66
12. Papua New Guinea and Pacific Islands .....	66

SPECIES	End use of species				Operations/ Activities								REMARKS
					Exploration & collection		Evaluation		Conservation		Germplasm use		
	1	2	3	4	5	6	7	8	9	10	11	12	
<b>1. WESTERN USA/CANADA</b> No species were identified as top priority species for FAO coordinated activities													
<b>2. EASTERN USA/CANADA</b> No species were identified as top priority species for FAO coordinated activities													
<b>3. MEXICO</b>													
<i>Cedrela odorata</i>	✓		✓		1	1	1	1	1	1		1	PVT and PGT
<i>Cupressus lindleyi</i>	✓				1	1	1	1	1	1		1	
<i>Pinus chiapensis</i>	✓				2	1	1	1	1	1		1	PVT and PGT
<i>P. patula</i>	✓				2	1	1	1	1	1		1	PVT,PGT,SO
<i>P. pseudostrobus</i>	✓				2	1	1	1	1	1		1	PVT,PGT,SO
<i>Swietenia macrophylla</i>	✓		✓		1	1	1	1	1	1		1	PVT, PGT, SO
<b>4. CARRIBEAN, CENTRAL AMERICA, COLOMBIA, VENEZUELA AND ECUADOR</b>													
<i>Cedrela odorata</i>	✓				1	1	1	1	1	3	3	1	PVT, PGT in progress. (E) in most parts of range
<i>Cordia alliodora</i>	✓			✓					2	2	2	1	PVT, PGT, CLT,SO established. Vegetative propagation and breeding systems studies completed
<i>Gliricidia sepium</i>			✓	✓			2		2	2		2	PVT, <i>in situ</i> and <i>ex situ</i> stands and SO established
<i>Pinus caribaea</i> var. <i>hondurensis</i>	✓	✓							1	1	1	1	PVT, PGT, <i>in situ</i> and <i>ex situ</i> seed stands established
<i>P. tecunumanii</i>	✓	✓							1	1	1	1	PVT, PGT, <i>in situ</i> and <i>ex situ</i> seed stands established
<i>Swietenia macrophylla</i>	✓				1	1	1	1	1	1	3	1	PVT,PGT established; genetic variability studies in progress. (E) in most parts of range.
<b>5. SOUTH AMERICA (EXCEPT COLOMBIA, VENEZUELA AND ECUADOR)</b>													
<i>Aniba rosaeodora</i>		✓			2	1	1	1	1	1	1	1	
<i>Caesalpinia echinata</i>		✓			2	1	2	1	1	1	1	1	
<i>Dalbergia nigra</i>	✓				2	1	2	1	2	1	2	1	
<i>Maytenus ilicifolia</i>		✓		✓	2	1	2	1	2	1	1	1	
<i>Nothofagus alessandrii</i>	✓				1	1	1	1	1	1	1	1	
<i>Swietenia macrophylla</i>	✓				2	2	2	1	2	2	2	1	
<i>Tabebuia cassindides</i>	✓			✓	2	1	2	1	1	1	1	1	

*Albizia procera*

SPECIES	End use of species				Operations/ Activities								REMARKS
					Exploration & collection		Evaluation		Conservation		Germplasm use		
	1	2	3	4	5	6	7	8	9	10	11	12	
<i>Azadirachta indica</i>	✓	✓	✓	✓	1	1	1	1	1	1	1	1	Multipurpose tree. Medicinal, rural use
<i>Bamboo (Bambusa, Dendrocalamus, Phyllostachys spp.)</i>	✓	✓	✓	✓	2	2	2	2	1	2	2	2	Poor persons timber in rural areas
<i>Casuarina equisetifolia</i>	✓	✓	✓	✓		1		1		1	1	1	Exotic. Planted in coastal India
<i>Cedrus deodara</i>	✓		✓	✓			2	3	2	2	1		M. Himalayas indigenous
<i>Dalbergia sissoo</i>	✓	✓	✓	✓	1	1	1	1	1	1	1	1	Fast growing coppice. Multipurpose use in rural areas
<i>Larix kaempferi</i>	✓	✓	✓		3	2	1	1	1	1	2	2	SO, crossed with other larches
<i>Pinus massoniana</i>	✓	✓	✓	✓	1	1	1	1	1	1	1	1	Clonal seed orchards in China. Cross breeding with <i>P. densiflora</i> in Japan
<i>Toona sinensis</i>	✓	✓	✓	✓	1	1	1	1	1	1	1	1	MPTS
<b>10. AFRICA</b>													
<i>Acacia senegal</i>		✓	✓	✓	1	1	1	1	1	1	3	2	(E) populations in N parts of range. Problems with natural regeneration
<i>Khaya</i> spp.	✓				1	1	1	1	1	1	1	1	Selection for resistance to shoot borer. Seed collections initiated
<i>Prunus africana</i>	✓	✓		✓	1	1	1	1	1	1	2		(E). Recalcitrant seed. Field genebank
<i>Sclerocarya birrea</i>				✓	2	2	2	2	1	1		2	Recalcitrant seed. Field: ICRAF in SADC countries, FAO in CILSS countries
<i>Tamarindus indica</i>			✓	✓	1	1		2		1	1	1	
<b>11. AUSTRALIA AND NEW ZEALAND</b>													
<i>Acacia mangium</i>	✓	✓	✓	✓	3	3	2	2	3	2	2	2	
<i>Pinus radiata</i>	✓	✓	✓	✓	3	3	3	3	2	1	3	1	Australia, New Zealand, Chile, Spain, South Africa. Pitch canker threat to natural stands
<b>12. PAPUA NEW GUINEA AND PACIFIC ISLANDS</b>													
<i>Santalum</i> spp.		✓			2		2		1			2	SPRIG priority
<i>Swietenia macrophylla</i>	✓					2	3			2		2	SPRIG priority



**APPENDIX 12**

**FOREST GENETIC RESOURCES PRIORITIES  
(BY REGION, SPECIES AND OPERATION)**

**SPECIES IDENTIFIED AS HIGH, GLOBAL, REGIONAL  
AND/OR NATIONAL PRIORITY**

**NOTES**

**(i) General Observations**

The present Appendix, complementing Appendix 11, represents an attempt to provide a list of high priority forest tree species at regional, eco-regional or sub-regional level.

The present list does not present an exhaustive list of woody perennial species in need of attention. It aims at providing information on those species and provenances which the FAO Panel of Experts on Forest Gene Resources, during its 11th Session in September/October 1999, considered should be given high priority **in the work programme of international, regional, bilateral and national institutions and agencies, the private sector, and FAO.**

The Panel of Experts recognized that many of the priority ratings must be considered tentative; the list will need continuing up-dating and must be modified in the light of new information, knowledge and needs.

The list is based on the experts' opinion. The diversity of forest types, status and condition, and the different types and scales of values used to rank forest tree species among countries and cultures, make the establishment of objective, global guidelines, a difficult exercise. In their own capacity, and on the basis of their personal experience, experts have reviewed information from national and regional sources, and ranked those species which appeared to present high **actual or potential value, at species or population level<sup>29</sup>**. Lists given for the Pacific Islands are drawn from conclusions of the Pacific Sub-regional Workshop on Forest and Tree Genetic Resources (see Appendix 9).

The present list includes, and should be reviewed in conjunction with, those species ranked as top priority for FAO's coordinated work (Appendix 11). There is, furthermore, a need to supplement both lists drawn up by the Panel with more detailed, national lists of priorities at local and national level.

This list emphasizes the importance of the genetic variation between species, and within species, and does not specifically target endangered or threatened species or populations because of their endangered condition. Similarly, although in exceptional cases referring to genera, the list does not refer to ecosystems or biota.

Readers interested in endangered or threatened tree and shrub species may wish to refer to:

- (i) the *2000 IUCN Red List of Threatened Species*, at <http://www.redlist.org/>;
- (ii) the *World List of Threatened Trees*, by S. Oldsfield, C. Lusty and A. MacKinnon, World Conservation Press, Cambridge, 1998;
- (iii) the *World Conservation Monitoring Centre's Tree Conservation Database*, available on Internet at: [http://www.wcmc.org.uk/cgi-in/SaCGI.cgi/trees.exe?FNC=database\\_Aindex\\_html](http://www.wcmc.org.uk/cgi-in/SaCGI.cgi/trees.exe?FNC=database_Aindex_html)

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<sup>29</sup> See Appendix 7 for more details on priority setting processes

(ii) **Legend**

A fold-out flap on the inside of the back cover summarizes the indications given below.

**"Main End Use of Species" (columns 1-4)**

Column 1, "*Industrial Wood*": sawn logs, timber, heavy construction wood, plywood, chip and particle board, wood pulp.

Column 2, "*Industrial Non-Wood Products*": gums, resins, oils, tannins or other products used in small, medium and large-scale local and non-local industries.

Column 3, "*Fuelwood, Posts, Poles*": firewood and wood used for the production of charcoal and energy; roundwood used on-farm.

Column 4, "*Other Uses (goods, services)*": food, fodder, land stabilization, soil amelioration, shade, shelter and other environmental and cultural or religious values.

**"Operations/Activities"**

The list indicates priority on a scale from 1 to 3 for the various operational steps identified: exploration, evaluation, conservation and utilization of germplasm (including selection and breeding), as follows:

- (1) Highest priority
- (2) Prompt action recommended
- (3) Action is important, but of less urgency than that for species listed as priority (1) and (2).

**"Remarks" column**

PVT = provenance trial  
PGT = progeny trial  
CLT = clonal trials  
SO = seed orchard  
(F) = endangered at species or provenance level  
MPTS = multi purpose tree species

The fold-out flap on the inside of the back cover recalls the indications given above.

**LIST OF SPECIES IDENTIFIED AS HIGH, GLOBAL, REGIONAL  
AND/OR NATIONAL PRIORITY**

1. Western USA/Canada.....	70
2. Eastern USA/Canada .....	71
3. Mexico.....	72
4. Caribbean, Central America, Colombia, Venezuela and Ecuador.....	73
5. South America (except Colombia, Venezuela and Ecuador) .....	74
6. Northern and Central Europe.....	75
7. Mediterranean Region, Southern Europe and Near East.....	76
8. South-East Asia (excl. China and India) .....	77
9. North, North-East and Central Asia (incl. China, Dem. People's Rep. of Korea, India, Japan, Mongolia and Rep. of Korea).....	78
10. Africa.....	80
11. Australia and New Zealand .....	83
12. Papua New Guinea and Pacific Islands .....	85

SPECIES	End use of species				Operations/ Activities								REMARKS
					Exploration & collection		Evaluation		Conservation		Germplasm use		
	1	2	3	4	5	6	7	8	9	10	11	12	
<b>1. WESTERN USA/CANADA</b>													
<i>Abies amabilis</i>	✓			✓			3						Int. PVT
<i>A. bracteata</i>	✓				2		3						
<i>A. concolor</i>	✓										3		
<i>A. grandis</i>	✓			✓							3		Int. PVT
<i>A. lasiocarpa</i>	✓												Int. PVT
<i>A. magnifica</i> var. <i>shastaensis</i>	✓								3				
<i>A. procera</i>	✓	✓					3						Int. PVT, breeding programs
<i>Acer macrophyllum</i>	✓			✓									<i>In situ</i> cons. stands
<i>Alnus rhombifolia</i>				✓									<i>In situ</i> cons. stands
<i>A. rubra</i>	✓			✓	✓	3	2	2		3		2	PVT. Seed in storage for int. PVT
<i>A. sinuata</i>				✓									<i>In situ</i> cons. stands
<i>A. tenuifolia</i>				✓									<i>In situ</i> cons. stands
<i>Arbutus menziesii</i>				✓									<i>In situ</i> cons. stands
<i>Betula fontinalis</i>				✓									<i>In situ</i> cons. stands
<i>B. papyrifera</i>				✓									<i>In situ</i> cons. stands
<i>Castanopsis chrysophylla</i>				✓									<i>In situ</i> cons. stands
<i>Celtis douglasii</i>				✓									<i>In situ</i> cons. stands
<i>Chamaecyparis lawsoniana</i>	✓												Root rot affecting species: <i>Phytophthora lateralis</i>
<i>Chamaecyparis nootkatensis</i>	✓			✓	3	2	2						Tests and collections
<i>C. macrocarpa</i>	✓				3	3	3						
<i>Cornus nuttalli</i>				✓	3								
<i>Crataegus douglasii</i>				✓					3				
<i>C. columbiana</i>				✓					3				
<i>Cupressus arizonica</i> (complex)	✓				2	3	3	2				2	
<i>C. bakeri</i>				✓				3					
<i>Fraxinus latifolia</i>				✓				3					
<i>Juniperus occidentalis</i>				✓	3								
<i>J. scopulorum</i>				✓	3								
<i>Larix laricina</i>	✓										3	2	
<i>L. lyallii</i>	✓			✓	2								
<i>L. occidentalis</i>	✓			✓	3			2					Breeding trials
<i>Libocedus decurrens</i>	✓							3					
<i>Lithocarpus densiflorus</i>				✓				3					

SPECIES	End use of species				Operations/ Activities								REMARKS
					Exploration & collection		Evaluation		Conservation		Germplasm use		
	1	2	3	4	5	6	7	8	9	10	11	12	
<i>Malus fusca</i>				✓					3				
<i>Picea breweriana</i>	✓								3				
<i>T. mertensiana</i>	✓												Collection
<i>Umbellularia californica</i>				✓									<i>In situ</i> cons. stands
<b>2. EASTERN USA/CANADA</b>													
<i>Abies balsamea</i>	✓			✓		3		3			3		Breeding progr.
<i>A. fraseri</i>	✓			✓	2	3		3	2		3		Breeding progr.
<i>Acer saccharum</i>	✓	✓	✓	✓		2		3	2	2		3	
<i>Betula alleghaniensis</i>	✓				3				2		3	3	
<i>Carya cordiformis</i>	✓				3	2		3		2			
<i>C. illinoensis</i>				✓	3	3		3					Of recent interest to China
<i>C. ovata</i>	✓					2		3		2			
<i>Castanea dentata</i>	✓	✓	✓	✓	2	1			1	1	1	1	International att. needed to ensure continued efforts in developing resistance *
<i>Celtis tenuifolia</i>	✓		✓		2	3			2	3			
<i>Fraxinus americana</i>	✓								3				
<i>F. quadrangulata</i>	✓		✓		2	2			2	2			
<i>Gymnocladus dioieus</i>	✓		✓			2			2	2			
<i>Juglans cinerea</i>	✓					2		2	2	2			<i>Ex situ</i> cons. required in Canada
<i>J. nigra</i>	✓			✓							2	2	
<i>Larix laricina</i>	✓					3		3			3	2	
<i>Liquidambar styraciflua</i>	✓					2		2			2	2	
<i>Liriodendron tulipifera</i>	✓								3		3	2	Collection and testing in Eastern U.S.
<i>Magnolia acuminata</i>	✓		✓			2			2	2			
<i>Picea glauca</i>	✓												Breeding progr.
<i>P. mariana</i>	✓												Breeding progr.
<i>P. rubens</i>	✓										3	2	
<i>Platenus occidentalis</i>	✓					2		2			2	2	
<i>Pinus banksiana</i>	✓												Breeding progr.
<i>P. clausa</i>	✓										3	3	
<i>P. rigida</i>	✓			✓		3		3					
<i>P. echinata</i>	✓					2		2			2		Breeding progr. in Eastern U.S.
<i>P. elliotii</i>	✓												Breeding progr. in Eastern U.S.

SPECIES	End use of species				Operations/ Activities								REMARKS
					Exploration & collection		Evaluation		Conservation		Germplasm use		
	1	2	3	4	5	6	7	8	9	10	11	12	
<i>P. palustris</i>	✓												Breeding progr. in Eastern U.S.
<i>P. resinosa</i>	✓												Breeding progr.
<i>P. serotina</i>	✓					2		2	3		3	3	
<i>P. strobus</i>	✓												Breeding progr.
<i>P. taeda</i>	✓												Breeding progr.
<i>P. virginiana</i>	✓										2	2	
<i>Populus balsamifera</i>	✓					2		2			3	2	High potential for biomass on medium fertility soils
<i>P. deltoides</i>	✓							2					Breeding progr.
<i>P. tremuloides</i>	✓					3		2	3				Breeding progr. in U.S.
<i>Prunus serotina</i>	✓					3		3	3		3		Canadian populations at extremes of range
<i>Ptelea trifoliata</i>	✓		✓		2	2			1	2			
<i>Quercus alba</i>	✓		✓			2		2		3		3	Canadian populations at extremes of range
<i>Q. borealis</i>	✓		✓			3		3		3		3	
<i>Q. macrocarpa</i>	✓		✓		1	3		3	3				
<i>Robinia pseudoacacia</i>	✓		✓			3		3					
<i>Taxodium ascendens</i>	✓				2	3		3	3		3		
<i>T. distichum</i>	✓				2	3		3	3		3		
<i>Torreya taxifolia</i>				✓					2				
<i>Ulmus americana</i>	✓			✓	3	3		3	2	3	3		Resistance breeding progr.
<b>3. MEXICO</b>													
<i>Brosimum alicastrum</i>	✓			✓	1	1	1	1	1	1	1	1	Used for fodder
<i>Calophyllum brasiliense</i>	✓		✓		1	1		1	2	3	3	2	
<i>Cedrela odorata</i>	✓		✓		1	1		1	1	1	1	1	Timber
<i>Cordia alliodora</i>	✓		✓		3	3		3			3		
<i>C. dodecandra</i>	✓		✓		2	2		2	2		3		
<i>Cupressus lindleyi</i>	✓				2	1	1	1	1	1	1	1	(E) Populations
<i>Dendropanax arboreus</i>	✓		✓		1	1	1	1	2	2		1	PVT
<i>Fraxinus uhdei</i>	✓		✓		2	2		2	1	2	3		
<i>Metopium brownei</i>	✓				3	3		2					
<i>Pinus ayacahuite</i> var. <i>veitchii</i>	✓												
<i>P. cembroides</i>				✓	1	1	1	1	1	1	1	1	PVT, PGT. Human food
<i>P. chiapensis</i>	✓				2		1		1			1	PVT and PGT
<i>P. durangensis</i>	✓				3	3		3				2	
<i>P. gregii</i>	✓				2	2		2	3	3			(E) populations

SPECIES	End use of species				Operations/ Activities								REMARKS
					Exploration & collection		Evaluation		Conservation		Germplasm use		
	1	2	3	4	5	6	7	8	9	10	11	12	
<i>P. engelmannii</i>	✓				3	3		3			3		
<i>P. herrerae</i>	✓				3	3		3			3		
<i>P. michoacana</i>	✓				3	3		3				2	
<i>P. montezumae</i>	✓				3	3		3				2	PVT, PGT
<i>P. oocarpa</i>	✓				3								PVT, PGT
<i>P. patula</i>	✓				2			2	2				PVT (Int.), PGT
<i>P. pinceana</i>				✓	3	3	2	2	3	3	2	2	Human food
<i>P. pseudostrobus</i>	✓				3	3		2			2	3	PVT, PGT
<i>Prosopis juliflora</i>			✓	✓	2	2		2		2	2	2	PVT
<i>Pseudotsuga flahaulti</i>				✓	2	2		2			3		Christmas trees
<i>Swietenia macrophylla</i>	✓			✓	1	1	1	1	1	1	1	1	PVT, PGT, SO. (E) populations
<b>4. CARRIBEAN, CENTRAL AMERICA, COLOMBIA, VENEZUELA AND ECUADOR</b>													
<i>Albizia guachepele</i>	✓		✓		2	2		2	1	2	2	2	PVT, PGT established. Vegetative propagation studies
<i>Alnus acuminata</i>	✓			✓	1	1		3	1	1		1	PVT, PGT, <i>in situ</i> stands established
<i>Astronium graveolens</i>	✓				2			2	1	1		1	Not planted extensively
<i>Bombacopsis quinata</i>	✓				2		2	2	1	1	2	1	PVT,PGT in progress. SO established. (E) in most parts of range
<i>Callophyllum brasiliense</i>	✓		✓		2		2	2	2	2	2	2	Not planted extensively
<i>Carapa guianensis</i>	✓				2			2	2	2			Not planted extensively
<i>Cedrela tonduzzi</i>	✓				2	2			2	2			(E) in most parts of range
<i>Cupressus lusitanica</i>	✓				2	2		2	2				<i>Ex situ</i> seed stands established. Local PVT,PGT
<i>Dalbergia retusa</i>	✓				2			2	2	2			Not planted extensively
<i>Diphysa robinoides</i>			✓	✓					2	2			Not planted extensively
<i>Enterolobium cyclocarpum</i>			✓	✓	2	2	3	3	2	2			Seed stands established
<i>Guazuma ulmifolia</i>			✓		2	2		2					PVT. Not planted extensively
<i>Hyeronima alchorneoides</i>	✓				2			2	2	2			Not planted extensively
<i>Hymenaea courbaril</i>	✓				2			2	2	2			Not planted extensively
<i>Leucaena leucocephala</i>			✓	✓	1	1		1	1	1	1	1	PVT in progress. SO
<i>Pinus maximinoi</i>	✓										3	3	PVT in progress
<i>P. oocarpa</i>	✓			✓					1	1	1	1	PVT, <i>ex situ</i> conservation stands established
<i>P. pseudostrobus/tenuifolia</i>	✓			✓	1				1				PVT in progress. (E) in parts of range

SPECIES	End use of species				Operations/ Activities								REMARKS
					Exploration & collection		Evaluation		Conservation		Germplasm use		
	1	2	3	4	5	6	7	8	9	10	11	12	
<i>Samanea saman</i>			✓	✓	1		2	3					Not planted extensively
<i>Sideroxylon capiri</i>	✓				2		2		2	2			Not planted extensively
<i>Simaruba glauca</i>	✓		✓		2		2		2	2			Not planted extensively
<i>Swietenia humilis</i>	✓			✓	2	2	2		1	2	2	1	PGT, SO established. Not planted extensively
<i>Swietenia mahagoni</i>	✓				1		1		1	1	1	1	(E) in most parts of range
<i>Tabebuia donnel-smithii</i>	✓			✓	2		2		2	2			Not planted extensively
<i>Tabebuia rosea</i>	✓		✓		1	1	1	1	1	1	3	1	Restricted prov. collections
<i>Terminalia amazonia</i>	✓				2		2		2	2			Not planted extensively
<i>Virola koschnyi</i>	✓				2		2		2	2			Not planted extensively
<i>Vochysia quatemalensis</i>	✓				1	1	1	1	1	3	2	1	PVT, PGT established. Veg propagation studies
<b>5. SOUTH AMERICA (EXCEPT COLOMBIA, VENEZUELA AND ECUADOR)</b>													
<i>Acacia bahiensis</i>			✓		1	2	2		2	3			
<i>Acharas sapota</i>				✓	2	2	2		1	2			Human food
<i>Anacardium humilis</i>				✓	2	2	1		1	1			
<i>Aniba rosaeodora</i>		✓			1	2	1	2	1	2			(E)
<i>Araucaria angustifolia</i>	✓				2	2	2	2	2	2	2	2	(E)
<i>A. araucana</i>	✓				2	2	2	2	1	2	2	2	(E)
<i>Aspidosperma polyneuron</i>	✓				2	1	2	2	2	2	1	1	
<i>Austrocedrus chilensis</i>	✓		✓		2	2	2	2	2	2	2	2	
<i>Bertholetia excelsa</i>	✓	✓			2	1	2	2	2	2	2	1	MPTS
<i>Caesalpinia echinata</i>	✓				2	1	3	1	3	2			(E)
<i>Cariniana legalis</i>	✓				2	1	2	2	2	2	2	1	(E)
<i>Caryocar brasiliense</i>	✓	✓	✓		2	2	2	2	2	2	1	1	Human food
<i>Cedrela fissilis</i>	✓				2	2	2	2	2	2	1	1	(E)
<i>C. odorata</i>	✓				2	2	2	2	2	2	1	1	(E)
<i>Cordia goeldiana</i>	✓				2	2	2	2	2	2		1	
<i>Dalbergia nigra</i>	✓				2	1	2	1	2	1			(E)
<i>Dipteryx alata</i>	✓	✓			2	2	2	2	1	2			Human food
<i>Euterpe edulis</i>		✓			2	2	2	2	1	2	2	3	Human food
<i>E. oleracea</i>		✓			2	2	1	1	2	1	2	3	Human food
<i>E. precatoria</i>				✓	2	2	2	2	2	2	2	2	Human food
<i>Fitzroya cupressoides</i>	✓				2	2	2	2	1	2	2	2	
<i>Hymenaea courbaril</i>	✓				3	2	2	3	1	2			
<i>Juglans neotropica</i>	✓				1	2	1	2	1	2			(E)



SPECIES	End use of species				Operations/ Activities								REMARKS
					Exploration & collection		Evaluation		Conservation		Germplasm use		
	1	2	3	4	5	6	7	8	9	10	11	12	
<i>Lecythis pisonis</i>	✓			✓	2	2	2	2	1	2			Human food
<i>Maytenus ilicifolia</i>		✓		✓	2	1	2	1	2	1	1	1	
<i>Melanoxylon brauna</i>	✓		✓		3	3	2	3	2	3			
<i>Micropholis melinoniana</i>	✓				1	2	1	2	2	2			(E)
<i>Myracrodruon urundeuva</i>	✓		✓	✓	2	1	2	2	2	1			
<i>Nothofagus alessandrii</i>	✓				2	2	2	2	2	2	2	2	(E)
<i>Ocotea catharinensis</i>	✓				2	2	1	2	1	2			(E)
<i>O. porosa</i>	✓				2	1	1	1	1	1			(E)
<i>Pilocarpus jaborandi</i>		✓			1	2	1	2	1	2			
<i>Prosopis juliflora</i>			✓	✓	2	2	2	2	2	2	2	2	
<i>P. chilensis</i>			✓	✓	2	2	2	2	2	2	2	2	
<i>Quiina glaziovii</i>				✓	2	3	2	3	2	3			Medicinal products
<i>Sophora toromiro</i>		✓			2	2	1	2	1	2	2	2	(E)
<i>Spondias tuberosa</i>		✓		✓	2	1	1	1	1	1			Human food
<i>Stylites andicola</i>	✓				2	2	2	2	2	2	2	2	
<i>Swietenia macrophylla</i>	✓				2	2	2	1	2	2	2	1	(E)
<i>Tabebuia cassinoides</i>	✓				2	1	2	1	1	1	1	1	(E)
<i>T. heptaphylla</i>	✓			✓	3	2	2	3	2	2			
<i>Torresya acreana</i>	✓				2	1	1	1	1	1			
<i>Virola surinamesis</i>	✓				2	2	2	2	1	1		1	
<b>6. NORTHERN AND CENTRAL EUROPE</b>													
<i>Abies alba</i>	✓				2	2			2	2			Pollution
<i>Fraxinus excelsior</i>	✓			✓	1	1			1	1			
<i>Juglans regia</i>	✓			✓		3		3		3		3	Human food
<i>Larix sukaczewii</i>	✓					3		3	2				In Russia
<i>Picea abies</i>	✓				2	2		2	2	2	2	2	Pollution – EUFORGEN network
<i>Pinus sylvestris</i>	✓				2	2	3	3	3	3			Scotland, Spain, Turkey
<i>Populus nigra</i>	✓			✓	2	2			2	2		2	EUFORGEN network
<i>Prunus avium</i>	✓			✓	2	2	2		2	2		2	EUFORGEN network
<i>Quercus robur</i>	✓			✓	2	2	2	2	2	2		2	Northern Europe – EUFORGEN network
<i>Taxus baccata</i>				✓	1	1			2	2			Baltic
<i>Tilia cordata</i>	✓			✓	2	2	2	2	2	2	1		EUFORGEN Network
<i>Ulmus glabra</i>	✓			✓	2	2	2	2	2	2			Elm disease – EUFORGEN network
<i>U. laevis</i>				✓	1	1	1	1	1	1			EUFORGEN network

SPECIES	End use of species				Operations/ Activities								REMARKS
					Exploration & collection		Evaluation		Conservation		Germplasm use		
	1	2	3	4	5	6	7	8	9	10	11	12	
<b>7. MEDITERRANEAN REGION, SOUTHERN EUROPE AND NEAR EAST</b>													
<i>Abies marocana</i>				✓		2			2	2			
<i>A. nordmanniana/bornmullariana</i>	✓				3	2		2			2	2	
<i>A. numidica</i>				✓		1			1	1			(E)
<i>A. pinsapo</i>	✓					2		2	2				
<i>Acacia albida</i>			✓	✓	2	1	1	1			1	1	
<i>A. nilotica</i>			✓	✓	1	1	1	1			1		Int. PVT in progress
<i>A. saligna</i>			✓	✓		1	1	1			1	1	Silva mediterranea
<i>A. senegal</i>			✓	✓	1	1	1	1			1	1	
<i>A. tortilis</i> (incl. ssp. <i>raddiana</i> )			✓	✓	1	1	1	1			1		Int. PVT in progress
<i>Cedrus atlantica</i>	✓			✓	2	2	2	2			1	2	Int. testing in progress. Silva mediterranea
<i>C. libani</i>	✓			✓	2	1	2	2	1	1	2	2	Int. testing. National stands in Lebanon (E). onservaion priority activities apply to Lebanon.
<i>Ceratonia siliqua</i>				✓	1	1	1	1					Silva mediterranea
<i>Cupressus atlantica</i>	✓				1	2		2	1		1	1	(E) ? in parts of range. Drought and frost tolerant. Important for breeding
<i>C. dupreziana</i>	✓			✓	1				1		1	1	(E). <i>Ex situ</i> cons. stands. Breeding for resistance to <i>Seridium cardinale</i>
<i>C. sempervirens</i>				✓	2	2		2				1	Breeding for resistance to <i>Seridium cardinale</i>
<i>Gleditzia triachantos</i>					1	1				1		1	
<i>Iuglans regia</i>	✓			✓	2					3		2	
<i>Picea omorika</i>	✓			✓		2				2			<i>In situ</i> cons. stands
<i>Pinus brutia</i>	✓			✓	3	2		2			1	1	Int. PVT. Further sampling desirable
<i>P. eldarica</i>	✓				2	1		2	1	1	2		Int. PVT. (E) some provenances
<i>P. halepensis</i>	✓			✓									Int. PVT
<i>P. laricio mauretanica</i>	✓					1				1			(E)
<i>P. pinaster</i>	✓			✓	2	1		2	1	1	1	1	Int. PVT
<i>P. pinea</i>	✓			✓	2	2		2			1	1	Silva mediterranea
<i>Platanus orientalis</i>				✓	1				2			2	(E) ? some provenances
<i>Prosopis cineraria</i>			✓	✓	1	1	1	1	1	1	2	2	
<i>Quercus aegilops</i>			✓	✓					2				

SPECIES	End use of species				Operations/ Activities								REMARKS
					Exploration & collection		Evaluation		Conservation		Germplasm use		
	1	2	3	4	5	6	7	8	9	10	11	12	
<i>Q. suber</i>		✓			2	2	2	2			2	2	Euforgen/ Silva mediterranea
<i>Tetraclinis articulata</i>				✓	1	1	1	1	2	2			
<i>Ulmus wallichiana</i>	✓								1				(E)
<b>8. SOUTH- EAST ASIA EXCL. CHINA AND INDIA</b>													
<i>Acacia auriculiformis</i>	✓		✓			1	1	1	1	1	1	1	Int. PVT in progress. Hybrids now developed against "heart rot"
<i>A. catechu</i>	✓	✓	✓	✓	2	3	3	3	2	2	2	2	MPTS for farmers
<i>A. cressicarpa</i>	✓		✓		1	1	1	1	1	1	1	1	Int. PVT in progress. Hybrids now developed against "heart rot"
<i>A. mangium</i>	✓		✓	✓		1	2		1	1	1	1	Int. PVT in progress. Hybrids now developed against "heart rot"
<i>Afzelia xylocarpa</i>	✓		✓		1	1		1		1	2	2	Good quality timber
<i>Agathis</i> spp.	✓		✓		1	1		1		1	2	1	Indonesia and Malaysia
<i>Aquilaria</i> spp.	✓	✓	✓		1	1	1	1	1	1	1	1	Medicinal products
<i>Artocarpus heterophyllus</i>	✓	✓	✓	✓	2	2	2	2	2	2	2	2	MPTS for farmers
<i>Araucaria</i> spp.	✓		✓	✓	2	2		2		2	1	2	Int. PVT in progress
<i>Azadirachta</i> spp.	✓	✓	✓	✓	1	1	1	1	2	1	1	1	Int. PVT in progress
<i>Cassia siamea</i>	✓	✓	✓	✓	2	2	2	2	2	2	2	2	Dry area spp.
<i>Casuarina</i> spp.	✓		✓	✓	1	1	1	1	1	1	2	2	Int. PVT. Coastal planting
<i>Dalbergia</i> spp.	✓		✓		1	1	1	1	1	1	2	2	Excellent wood
<i>Dipterocarp</i> spp.	✓		✓	✓	1	1	1	1	1	1	1	1	Quality timber for building and furniture
<i>Dyera costulata</i>	✓	✓	✓		1	1	1	1	1	1	1	1	Timber and gum
<i>Endospermum malaccensis</i>	✓		✓		2	2	3	3	3	3	3	3	Light wood
<i>Eucalyptus</i> spp.	✓	✓	✓	✓	2	2	2	2	2	2	1	1	Int. PVT in progress. Hybrid
<i>Gmelina arborea</i>	✓		✓		2	2	2	2	2	2	1	1	Good timber for ASEAN
<i>Leucaena leucocephala</i>	✓	✓	✓	✓	2	1		1		1		1	MPTS. Need selection
<i>Paraserianthes falcataria</i>	✓	✓	✓	✓	2	1	2	1	1	1	1	1	Good for biomass & veneer
<i>Parkia</i> spp.	✓	✓	✓	✓	1	1	1	1	1	1	1	1	MPTS spp.
<i>Peronema canensis</i>	✓		✓		1	1	1	1	1	1	1	1	MPTS spp.
<i>Pinus</i> spp.	✓	✓	✓		1	1	1	1	1	1	1	1	Timber species
<i>Pterocarpus</i> spp.	✓		✓		1	1	1	1	1	1	1	1	Excellent timber for furniture
<i>Rhizophora</i> spp.	✓	✓	✓		1	1	1	1	1	1	1	1	Threatened by aquaculture
<i>Santalum album</i>	✓	✓	✓		1	2	1	2	1	2	1	1	Promising MPTS
<i>Swietenia</i> spp.	✓		✓		1	1	1	1	1	1	1	1	Promising timber for ASEAN

SPECIES	End use of species				Operations/ Activities								REMARKS
					Exploration & collection		Evaluation		Conservation		Germplasm use		
	1	2	3	4	5	6	7	8	9	10	11	12	
<i>Tectona grandis</i> <u>9. NORTH, NORTH-EAST AND CENTRAL ASIA, INCL. CHINA , DPR KOREA, INDIA, JAPAN, MONGOLIA AND REP. OF KOREA</u>	✓		✓		1	1	1	1	1	1	1	1	Very important species
<i>Abies pindrow</i>	✓			✓	2	3	3	3	2			3	India. Hybrid populations occurring
<i>Acacia</i> spp.	✓	✓	✓	✓	1	1		3	1	1	1	1	Used in Indian sub-continent by rural masses for sustenance and income generation. Exotic
<i>Albizia</i> spp.	✓	✓		✓	1	1	1	1	1	1	1		
<i>Alnus cremastogyne</i>	✓	✓	✓	✓	2	2	2	2	1	1	1	1	Pioneer, fast growing
<i>A. formosana</i>	✓	✓	✓	✓	1	1	1	1	2	2	1	1	
<i>A. japonica</i>	✓	✓	✓	✓	2	2	2	2	1	1	1	1	China, Japan, Korea
<i>A. nepalensis</i>	✓	✓	✓	✓	1	1	1	1	1	1	1	1	
<i>A. mandshurica</i>	✓	✓	✓	✓	1	2	2	2	1	1	1	1	Nitrogen fixing in cold regions
<i>Azadirachta indica</i>	✓	✓	✓	✓	1	1	1	1	1	1	1	1	Used in Indian sub-continent by rural masses for sustenance and income generation. Exotic
<i>Bamboo</i>	✓	✓	✓	✓	2	2	2	2	1	2	2	2	Used in Indian sub-continent by rural masses for sustenance and income generation. Exotic
<i>Bombax ceiba</i>	✓		✓		1	1	1	1	1	1	1	1	Matchsticks
<i>Boswellia serrata</i>	✓	✓	✓	✓	1	1	1	1	1	1	1	1	India. Overexploited.
<i>Camellia oleifera</i>				✓	2	2	2	2	2	1	1	1	Valuable oil, Japan
<i>Castanea mollissima</i>	✓	✓	✓	✓	2	2	2	2	3	3	1	1	Nut, many varieties
<i>Casuarina</i> spp.	✓	✓	✓	✓		1		1		1	1	1	Used in Indian sub-continent by rural masses for sustenance and income generation. Exotic
<i>Cedrus</i> spp.	✓		✓	✓			2	3	2	2	1		
<i>Chamaecyparis obtusa</i>	✓	✓	✓	✓	1	1	1	1	1	1	1	1	PVT, SO in Japan
<i>Cinnamomum camphora</i>	✓	✓	✓	✓	2	2	2	2	2	2	2	2	Over exploited
<i>Cryptomeria japonica</i>	✓	✓	✓	✓	2	2	2	2	1	1	1	1	PGT, SO in Japan
<i>Cupressus duclouxiana</i>	✓	✓	✓	✓	2	2	2	2	2	2	2	2	
<i>C. funebris</i>	✓	✓	✓	✓	2	2	2	2	2	2	2	2	
<i>C. torulosa</i>	✓	✓	✓	✓	1	1	1	1	1	1	1	1	India. Soil binding timber species for dry exposed sites.
<i>Cunninghamia lanceolata</i>	✓	✓	✓	✓	2	2	2	2	1	1	1	1	

[illegible]

SPECIES	End use of species				Operations/ Activities								REMARKS
					Exploration & collection		Evaluation		Conservation		Germplasm use		
	1	2	3	4	5	6	7	8	9	10	11	12	
<i>P. densiflora</i>	✓	✓	✓	✓	2	2	2	2	1	1	1	1	PVT in Japan, S. Korea x <i>P. massoniana</i>
<i>P. koraiensis</i>	✓	✓	✓	✓	1	1	1	1	1		1	1	(E) in parts of range. Protected in China
<i>P. massoniana</i>	✓	✓	✓	✓	1	1	1	1	1	1	1	1	China, PVT, PGT, SO
<i>P. sylvestris</i> var. <i>mongolica</i>	✓	✓	✓	✓	1	1	1	1	2	2	1	2	China. PVT, PGT, SO
<i>P. tabulaeformis</i>	✓	✓	✓	✓	1	1	2	2	1	1	1	1	China. PVT, PGT, SO
<i>P. yunnanensis</i>	✓		✓	✓	1	1	1	1	1	1	1	1	PVT, PGT, SO
<i>Populus</i> spp.	✓		✓		1	1	1	1	1	1	1	1	Plywood. Exotic
<i>P. deltoides</i>	✓		✓	✓	2	1	1	1	1	1	1	1	India
<i>P. euphratica</i>	✓		✓	✓	1	1	1	1	1	1	1	1	China. Dry areas
<i>P. simonii</i>	✓		✓	✓	2	2	2	2	2	2	2	2	
<i>P. tomentosa</i>	✓		✓	✓	2	2	2	2	2	2	2	2	Endemic to China
<i>Quercus mongolica</i>	✓	✓	✓	✓	2	2	1	2	1	1	1	1	
<i>Q. variabilis</i>	✓	✓	✓	✓	1	1	2	2	1	1	1	1	
<i>Salix matsudana</i>	✓	✓	✓	✓	2	2	2	2	2	2	1	1	
<i>Santalum album</i>	✓		✓	✓	1	1	1	1	1	1	1	1	India. Overexploited
<i>Sapium sebiferum</i>	✓	✓	✓	✓	2	2	2	2	2	2	1	1	China, MPTS
<i>Sassafras tzumu</i>	✓	✓	✓	✓	2	2	2	2	2	3	1	2	
<i>Shorea</i> spp.	✓	✓	✓	✓	1	1	1	1	1	1	1	1	India, China
<i>Syzygium cumini</i>	✓		✓	✓	1	1		2	1	1	3	1	India. High genetic variation, polyembryony chromosomal races
<i>Taiwania cryptomerioides</i>	✓	✓	✓	✓	2	2	2	2	1	1	2	2	(E), Taiwan, China
<i>Terminalia</i> spp.	✓	✓	✓	✓	1	1	2	2	1	1	1	1	India
<i>Tilia amurensis</i>	✓	✓	✓	✓	2	2	2	2	2	2	1	1	
<i>Toona microcarpa</i>	✓	✓	✓	✓	1	1	1	1	2	2	1	1	MPTS
<i>T. sinensis</i>	✓	✓	✓	✓	1	1	1	1	2	2	1	1	
<i>Tsuga chinensis</i>	✓	✓	✓	✓	2	2	2	2	2	2	3	3	
<i>Ulmus parviflora</i>	✓	✓	✓	✓	2	1	2	2	1	1	2	2	
<i>Zelkova schneideriana</i>	✓	✓	✓	✓	2	2	2	2	2	2	1	1	Breeding in Japan
10. AFRICA													
<i>Acacia erioloba</i>			✓	✓			3	2					PVT in progress
<i>A. holosericea</i>			✓	✓				2			2		Prov. collection
<i>A. karroo</i>		✓	✓	✓				2			2	3	PVT in progress
<i>A. nilotica</i>		✓	✓	✓	2	3	1	2			2	3	Int. PVT in progress. W. Africa to be completed. Problems with natural regeneration

SPECIES	End use of species				Operations/ Activities								REMARKS
					Exploration & collection		Evaluation		Conservation		Germplasm use		
	1	2	3	4	5	6	7	8	9	10	11	12	
<i>A. senegal</i>		✓	✓	✓	1	1	1	1	1	1	3	2	(E) populations in N parts of range. Problems with natural regeneration
<i>A. seyal</i>			✓	✓		1	1	1					
<i>Adansonia digitata</i>				✓	1	1	1	2			3	2	Int. PVT in progress. W. Africa to be completed.
<i>Azelia guanzensis</i>	✓				2	2	2	2					
<i>Androstachys johnsonii</i>			✓		2	2	2	2	2	2			
<i>Azadirachta indica</i>		✓	✓	✓			1	2	1	1	1	1	Int. PVT in progress
<i>Balanites aegyptiaca</i>				✓		2		2	2				(E) in Zimbabwe
<i>Borassus aethiopum</i>			✓	✓		1		1	1	2			(E)
<i>Chlorophora excelsa</i>	✓				2	1		1	2	2		2	(E)
<i>C. regia</i>	✓				2				2			2	
<i>Dacryodes edulis</i>				✓	2	2		2	2			2	Collection and propagation in progress
<i>Dalbergia melanoxylon</i>	✓				1	1		2	1	1			(E)
<i>Dichrostachys</i> spp.			✓	✓	1	2		2					Prov. collections proposed by OFI/NRI
<i>Entandrophragma</i> spp.	✓				1		1		2				
<i>Eucalyptus camaldulensis</i>	✓	✓	✓					2			1	2	
<i>E. saligna</i>	✓					2		2			2	2	
<i>Faidherbia albida</i>			✓	✓			2	3	2		2	2	Seed collections, PVT, PGT and population genetics studies in progress
<i>Gmelina arborea</i>	✓		✓			1		1			1	1	New collections available for testing
<i>Irvingia</i> spp.			✓	✓	1		1	2	1	2	1	1	(E). Collections made
<i>Juniperus procera</i>	✓			✓	2	2		2	2				(E) some provenances
<i>Khaya</i> spp.	✓				1	1	1	1	1	1	1	1	
<i>Maesopsis eminii</i>	✓		✓	✓	2	2		2			2	2	Selection for resistance to shoot borer
<i>Markhamia lutea</i>	✓		✓		2	2	2	2	2	2		2	
<i>Melia volkensii</i>	✓		✓					1			3	3	
<i>Ocotea</i> spp.	✓			✓	2	2		2	2				(E) some provenances
<i>Parinari curatellifolia</i>				✓	1	3	1	1					Collection done in SADC
<i>Parkia biglobosa</i>	✓			✓	2		1	3	1		1	1	Collections done
<i>Pericopsis angolensis</i>			✓					3	2				(E) some provenances. PVT, PGT commenced in East Africa
<i>P. elata</i>	✓				2	2		2	2	2			Prov. collections and gene ecological studies in progress

SPECIES	End use of species				Operations/ Activities								REMARKS
					Exploration & collection		Evaluation		Conservation		Germplasm use		
	1	2	3	4	5	6	7	8	9	10	11	12	
<i>Pinus maximinoi</i>	✓			✓				3		2	1	1	
<i>P. roxburghii</i>	✓					2		2					(E) in parts of range
<i>Podocarpus</i> spp.	✓				2	2	2	2					PVT in southern Africa
<i>Prosopis africana</i>			✓	✓	2		2	1					PVT in Sahel commenced
<i>Prunus africana</i>	✓	✓		✓	1	1	1	1	1	1	2		PVT, PGT ongoing in Cameroon and Kenya
<i>Pterocarpus angolensis</i>	✓					1		2	1	1			
<i>P. erinacensis</i>	✓								2				(E). Recalcitrant seed. Field genebank
<i>P. lucens</i>	✓			✓					2				<i>In situ</i> cons. in progress. Problem of die-back disease
<i>P. soyauxii</i>	✓								2				<i>In situ</i> cons. in progress
<i>Schinziophyton rautanenii</i>				✓	1	1	1	1					
<i>Sclerocarya birrea</i>				✓	2	2	2	2					Collections made & PVT in SADC.
<i>Sesbania</i> spp.			✓	✓			2	2					Collections made in SADC. PVT of <i>S. sesban</i> in progress in Zimbabwe, Zambia and Malawi
<i>Strychnos coccubides</i>				✓	1	3	1	1					Seed collections commenced in SADC
<i>Tamarindus indica</i>			✓	✓	1	1		2		1	1		
<i>Tectona grandis</i>	✓					1		1			2	1	
<i>Terminalia ivorensis</i>	✓				2	2		2	3		3	2	
<i>T. superba</i>	✓					2		2			3	3	
<i>Triplochiton scleroxylon</i>	✓				2						1	2	Int. prov. collections in progress
<i>Uapaca kirkiana</i>				✓	1	3	1	2					PVT, PGT commenced in SADC. Seed recalcitrant
<i>Vernonia amygdalina</i>				✓	2	2		2	2			2	
<i>Vitellaria paradoxa</i>				✓		1	1	2	1	1	2		Seed collections in progress in CILSS and Uganda
<i>Warburgia salutaris</i>				✓	1	1	2		1	1			Seed recalcitrant, vegetative multiplication
<i>W. ugandensis</i>	✓			✓	1	2		2	1		3		Seed supply problems, seed collections in progress
<i>Widdringtonia</i> spp.	✓				2	2	2	2	1				(E) in parts of range
<i>Ziziphus mauritiana</i>				✓	2	2	1	2					(E) in parts of range
<i>Z. micronata</i>			✓	✓	2	1	2	1			3		Evaluation of seed sources from India desirable



SPECIES	End use of species				Operations/ Activities								REMARKS
					Exploration & collection		Evaluation		Conservation		Germplasm use		
	1	2	3	4	5	6	7	8	9	10	11	12	
<b>11. AUSTRALIA AND NEW ZEALAND</b>													
<i>Acacia ampliceps</i>			✓	✓	1	1	1				3		Salt tolerant
<i>A. aulacocarpa</i>	✓		✓		1	1	1						Potential for tropical lowlands. SO
<i>A. colei</i>		✓			3		1				3	3	Proven food value
<i>A. crassicarpa</i>	✓										1	3	Biogeographic descriptions, sampling, PVT completed. SO
<i>A. elachantha</i>			✓	✓		1	1				2	2	Species for dry tropical lowland sites with poor soils. SO
<i>A. holosericea</i>			✓	✓	1	1	1	1	1	1	1	1	PVT
<i>A. mangium</i>	✓				3							1	Biogeographic descriptions completed, sampling, PVT. Hybrids being developed with <i>A. auriculiformis</i> . SO
<i>A. mearnsii</i>	✓		✓	✓		1	1				3		Int. PVT
<i>A. melanoxylon</i>	✓		✓	✓	2	3	3					3	
<i>A. stenopylla</i>			✓	✓	2	2	2						
<i>A. tumida</i>			✓	✓	1	2	2				2		Under taxonomic revision
<i>Araucaria cunninghamii</i>	✓				2	2	2				1	1	Int. PVT in progress
<i>Brachychiton populneus</i>				✓	1	1	1	1	1	1	1	3	Drought resistant
<i>Casuarina cunninghamiana</i>	✓		✓	✓	3	3	3					3	PVT.
<i>C. equisetifolia</i>				✓	2	2	1	2					Int. PVT underway
<i>C. glauca</i>	✓		✓	✓		3	3						Salt tolerant
<i>Eucalyptus benthamii</i>	✓		✓	✓		1	1	2	1	1	1	3	Restricted natural distribution. (E) in parts of range. Promising in trials
<i>E. camaldulensis</i>	✓		✓	✓	1	1	3	1	1		1	1	Taxonomic assessment ongoing
<i>E. citriodora</i>	✓		✓	✓	2	1	1				1	1	
<i>E. cladocalyx</i>	✓		✓	✓	3	2	2	2	2	2	2	1	
<i>E. cloeziana</i>	✓		✓			1	1				2	3	
<i>E. dunnii</i>	✓				2	2	2				1		Bulk seed difficult and costly to obtain
<i>E. globulus</i> ssp. <i>globulus</i>	✓		✓	✓	1	1	1	1	1	1	1	1	Int. PVT in progress. (E) some provenances
<i>E. grandis</i>	✓		✓	✓			3				1		PVT
<i>E. maculata</i>	✓		✓	✓	1	2	2		2				
<i>E. nitens</i>	✓										1		PVT. Bulk seed difficult and costly to obtain
<i>E. occidentalis</i>	✓		✓		1	1	1						Tolerates saline soils and high pH

SPECIES	End use of species				Operations/ Activities								REMARKS
					Exploration & collection		Evaluation		Conservation		Germplasm use		
	1	2	3	4	5	6	7	8	9	10	11	12	
<i>E. pellita</i>	✓		✓			2		2			2	2	Closely related to <i>E. urophylla</i> . Potential for hybridization
<i>E. radiata</i>		✓		✓	2							1	Some forms high yield of cineole oil
<i>E. saligna</i>	✓										1	1	PVT
<i>E. tereticornis</i>	✓		✓		1						1	1	PVT
<i>Grevillea pteridifolia</i>			✓	✓	3	3		3					
<i>G. robusta</i>				✓	3	2	2	2				2	
<i>Leucaena</i> spp.			✓	✓		1		1			1	1	Agroforestry species
<i>Macadamia</i> spp.				✓	2	2	2	2	3	3		3	Nuts
<i>Melaleuca cajuputi</i>			✓	✓	1	1		1					
<i>M. leucadendra</i>	✓	✓	✓	✓	1	1		1			1	1	Tolerant of waterlogged, acid sulphate and saline conditions. Int. PVT
<i>Melia azedarach</i> var. <i>australasica</i>			✓	✓	1	1		1					
<i>Pinus brutia</i>	✓		✓	✓		1		1			1		
<i>P. caribaea</i>	✓					1		1	1	1	1	1	
<i>P. eldarica</i>	✓		✓	✓		1		1			1		Assessment for Australian dry zone
<i>P. elliottii</i>	✓			✓		1		1	1	1	1	1	
<i>P. halepensis</i>	✓		✓	✓		1		1			1		
<i>P. pinaster</i>	✓		✓	✓		2				1		1	
<i>P. radiata</i>	✓			✓	1	1	1	1	1	1	1	1	(E) in parts of range. Guadalupe Is.
<i>P. tecunumanii</i>	✓				1	1	1	1	1	1	2	2	
<i>Populus</i> spp.				✓	3	3	3	3	3	3	3	3	
<i>Pseudotsuga menziesii</i>	✓												PVT
<i>Santalum album</i>		✓		✓	1	1	1	1	1	1	1	1	Timber for carving. SPRIG proj. germplasm collection and evaluation in progress
<i>S. lanceolatum</i>		✓		✓	1	1	1	1	1	1	1	1	
<i>S. spicatum</i>		✓	✓		1	1	1	1	1	1	1	1	Timber for carving
<i>Syzigium paniculatum</i>	✓			✓	3	3	3	3	3	3	3	3	Ornamental, bonsai tree. Unsuitable for subtropical areas due to insect attack
<i>Sesbania formosa</i>			✓	✓	1	1		1					Close relative of <i>S. grandiflora</i>
<i>Toona ciliata</i> var. <i>australis</i>	✓				1	2		2					SPRIG proj. germplasm collection and evaluation in progress

SPECIES	End use of species				Operations/ Activities								REMARKS	
					Exploration & collection		Evaluation		Conservation		Germplasm use			
	1	2	3	4	5	6	7	8	9	10	11	12		
<b>12. PAPUA NEW GUINEA AND PACIFIC ISLANDS</b>														
<b>MELANESIA/ SOUTH-WEST PACIFIC Indigenous</b>														
<i>Acacia</i> spp.	✓			✓	3	1	3	3	3	2	2	3	Culturally important	
<i>Agathis macrophylla</i>	✓	✓			2	1	1	1	1	3	2	3		
<i>Calophyllum</i> spp	✓		✓	✓	2	2	2	2	2	2	2	3		
<i>Canarium indicum</i> & <i>C. harveyi</i>	✓	✓		✓	3	1	1	1	3	2	2	1		
<i>Cordia subcordata</i>	✓			✓	2	2	2	2	1	2	3	3		
<i>Dacrydium nidulum</i>	✓			✓	2	3	3	3	1	2				
<i>Diospyros</i> spp.				✓	2	2	2	2	2	3	2			
<i>Endospermum medullosum</i>	✓				2	1	1	1	1	2	1	1		
<i>Flueggea flexuosa</i>	✓				3	2	1	1	3		2	2		
<i>Gmelina moluccana</i>	✓				2	2	1	1	1	3	2	3		
<i>Intsia bijuga</i>	✓				2	1	2	2	1	3	2	2		
<i>Pleiogynium timorense</i>	✓				3	2	2	2	2	3	3	3		
<i>Pometia pinnata</i>	✓			✓	2	1	1	1	3	2	2	1		
<i>Pterocarpus indicus</i>	✓				2	1	1	1	1	3	2	1		
<i>Santalum</i> spp.		✓			1	1	1	1	1	2	1	1		
<i>Serianthes</i> spp.	✓				2	1	2	2						
<i>Syzygium</i> spp.	✓				3	2	2	2	3	2	3	2		
<i>Terminalia</i> spp.	✓			✓	3	2	2	2	2	1	2	2		
<i>Toona</i> spp ( <i>sureni</i> & <i>ciliata</i> )	✓				2	1	2	2	2	3	2	3		
<i>Xanthostemon</i> sp.					2	3	3	3	1	2				
<b>Introduced</b>														
<i>Gmelina arborea</i>	✓			✓			3	3			2	2		
<i>Pinus caribaea</i>	✓						1	1			1	1		
<i>Santalum album</i>		✓					2	2			2	2		
<i>Swietenia macrophylla</i>	✓						1	1			1	1		
<i>Syzygium malaccense</i>	✓						3	3			2	2		
<i>Tectona grandis</i>	✓			✓			2	2			2	2		
<b>POLYNESIA/EASTERN PACIFIC Indigenous</b>														
<i>Calophyllum inophyllum</i>	✓		✓	✓	2	1	2	2	1	2	2	2		
<i>Calophyllum neo-ebudicum</i>	✓		✓	✓	3	3	2	2	3	2		3		
<i>Cordia subcordata</i>	✓			✓	2	1	2	2	1	2	2	3		

SPECIES	End use of species				Operations/ Activities								REMARKS
					Exploration & collection		Evaluation		Conservation		Germplasm use		
	1	2	3	4	5	6	7	8	9	10	11	12	
<i>Intsia bijuga</i>	✓				2	2	2	2	1	2	2	3	
<i>Planchonella samoensis</i> (syn. <i>P. torricellensis</i> )	✓				3	2	1	1		3			
<i>Pometia pinnata</i>	✓			✓	1	1	1	1	1	1	1	1	
<i>Santalum spp.</i>		✓		✓	1	1	1	1	1	1	1	1	
<i>Syzigium inophylloides</i>	✓			✓	2	1	1	1	1	1	1	2	
<i>Terminalia richii</i>	✓			✓	2	3	2	2	2	1	3	2	
<i>Thespesia populnea</i>	✓				1	1	2	2	1	2	2	2	
<i>Alphitonia zizyphoides</i>	✓				2	1	3	3	2	2	2	1	
<i>Bischofia javanica</i>	✓				3	3	3	3	3	3	3	3	
<i>Canarium harveyi</i>		✓			3	3			2	2			
<i>Diospyros samoensis</i>				✓		3	3	3		3			
<i>Dysoxylum forsterii</i>	✓						3	3					
<i>Garcinia sessilis</i>				✓	3	3	3	3	3	3	2		
<i>Garuga floribunda</i>	✓			✓		3	3	3			3		
<i>Manilkara spp.</i>					2	3	3	3	2				
<i>Morinda citrifolia</i>		✓			2	1	1	1		2	1	1	
<i>Neonauclea forsterii</i>					3	3							
<i>Serianthes spp.</i>					3	3	3	3					
<i>Xylocarpus spp</i>	✓				3	3		2					
<b>Introduced</b>													
<i>Flueggea flexuosa</i>	✓					3	3	3			3		
<i>Pinus caribaea</i>	✓				3		2	2				2	
<i>Santalum spp.</i>		✓					2	2			2		
<i>Swietenia macrophylla</i>	✓				3		3	3			3	3	
<b>MICRONESIA &amp; NORTH-CENTRAL PACIFIC</b>													
<b>Indigenous</b>													
<i>Artocarpus spp.</i> ( <i>A. altilis</i> & <i>A. mariannensis</i> )			✓	✓	1	3	1	1		3	2	1	
<i>Barringtonia asiatica</i>				✓	2	2	3	3					
<i>Calophyllum inophyllum</i>	✓		✓	✓	2	2	1	1	3		3	3	
<i>Cordia subcordata</i>	✓			✓	1	2	2	2	3		3	2	
<i>Intsia bijuga</i>	✓				3	3	3	3	2			3	
<i>Morinda citrifolia</i>				✓	3	3	3	3			3	2	
<i>Pandanus tectorius</i>				✓	1	1	1	1	2	2	1	1	
<i>Pisonia grandis</i>	✓				1	2	2	2			3	1	
<i>Terminalia spp.</i> ( <i>T. catapp</i> & <i>T. samoensis</i> )	✓			✓	2	2	2	2		3	3	2	
<i>Thespesia populnea</i>				✓	3	1	1	1	2		2	2	

SPECIES	End use of species				Operations/ Activities								REMARKS	
					Exploration & collection		Evaluation		Conservation		Germplasm use			
	1	2	3	4	5	6	7	8	9	10	11	12		
<i>Argusia argentea</i>	✓				2	2	1	1				2	Timber for carving	
<i>Bruguiera gymnorrhiza</i>	✓				3	2	2	2	2					
<i>Camposperma brevipetiolata</i>	✓								3					
<i>Ficus tinctoria</i>	✓			✓	2	2	2	2						
<i>Hibiscus tiliaceus</i>				✓	1	2	3	3				3		
<i>Neisosperma oppositifolium</i>	✓						3	3				3		
<i>Pemphis acidula</i>	✓				3	3	3	3	3			3		
<i>Rhizophora spp</i>				✓			3	3	2			3		
<i>Serianthes spp.</i>	✓				3	3	3	3	2	3	3			
<i>Xylocarpus granatum</i>	✓								2					
Hawai'i														
<i>Acacia koa</i>	✓			✓	1	1	1	1	1	1	1	1		
<i>Meterosideros polymorpha</i>					1	1	2	2	1	3	2	2		
<i>Nothocestrum spp.</i>					1	1			1	1	2			
<i>Pritchardia spp.</i>					1	1			1	1	2			
<i>Santalum spp.</i>				✓	1	2			1	2	3			
<i>Sophora chrysophylla</i>					1	1			1	3				
Introduced														
1. <i>Casuarina equisetifolia</i>				✓	3	2	3					3		
2. <i>Acacia spp.</i>	✓				3	2	2	2		3	3	2		

## **APPENDIX 13**

### **LIST OF DOCUMENTS DISTRIBUTED**

#### **A. DOCUMENTS DISTRIBUTED AT MEETING, OR AVAILABLE**

##### **Reports on Meetings/Secretariat Notes/Policies:**

1. Biotechnology extracts from Secretariat Note COAG/99/8. Committee on Agriculture, 15<sup>th</sup> Session, 25-29 January 1999
2. Spillane, C. Recent Developments in Biotechnology as they relate to Plant Genetic Resources for Food and Agriculture. Background Study Paper No. 9. 8<sup>th</sup> Session of the Commission on Genetic Resources for Food and Agriculture. FAO, Rome, April 1999. (E)
3. Cunningham, E.P. Recent Developments in Biotechnology as they relate to Animal Genetic Resources for Food and Agriculture. Background Study Paper No. 10. 8<sup>th</sup> Session of the Commission on Genetic Resources for Food and Agriculture. FAO, Rome, April 1999. (E)

##### **Technical Papers:**

4. Lester, D.T. and Libby W.J. (1998). External Evaluation of Somatic Embryogenesis for Enhancing Genetic Gains from British Columbia's Tree Breeding Programmes. Forest Genetics Council of British Columbia, Canada, June 1998
5. Mosseler, A. and Rajora, O.P. (1998). Monitoring population viability in declining tree species using indicators of genetic diversity and reproductive success. Paper for IUFRO Division 8 (Forest Environment) meeting in Kyoto, Japan, 19-23 Oct. 1998
6. CSIRO Division of Forestry and Forest Products (1998). Strategies for conserving the genetic resources of *Pinus radiata* outside California and Mexico. Workshop held in Canberra 6.10.98. Proceedings prepared by D. Spencer, K. Eldridge and C. Matheson. 23 pp.

##### **Miscellaneous:**

7. Rome Declaration on Forestry, 9 March 1999. Second Ministerial Meeting on Sustainability Issues in Forestry, the National and International Challenges, Rome 8-9 March 1999
8. Mandate of the FAO Panel of Experts on Forest Gene Resources
9. Basic Texts of FAO – Article I, Constitution

#### **B. DOCUMENTS DISTRIBUTED SINCE LAST SESSION**

##### **Documents/Publications:**

10. FAO, Rome (1998). The State of the World's Plant Genetic Resources for Food and Agriculture
11. FAO (1999). The State of the World's Forests 1999. FAO, Rome. 154pp.

##### **Reports on Meetings/Secretariat Notes/Policies:**

12. Summary Report of the Pacific Sub-Regional Workshop on Forest and Tree Genetic Resources, held in Apia, Samoa, 12-16 April 1999 (E/F/S)
13. Report of the 10<sup>th</sup> session of the FAO Panel of Experts on Forest Gene Resources
14. "Biotechnology" (C/E/F/S), COAG/99/8. Committee on Agriculture, 15<sup>th</sup> Session, Rome 25-29 January 1999

15. Correa, C.M. Access to Plant Genetic Resources and Intellectual Property Rights. Background Study Paper No. 8. 8<sup>th</sup> Session of the Commission on Genetic Resources for Food and Agriculture. FAO, Rome, April 1999. (E)
16. Spillane, C. Recent Developments in Biotechnology as they relate to Plant Genetic Resources for Food and Agriculture. Background Study Paper No. 9. 8<sup>th</sup> Session of the Commission on Genetic Resources for Food and Agriculture. FAO, Rome, April 1999. (E)
17. Cunningham, E.P. Recent Developments in Biotechnology as they relate to Animal Genetic Resources for Food and Agriculture. Background Study Paper No. 10. 8<sup>th</sup> Session of the Commission on Genetic Resources for Food and Agriculture. FAO, Rome, April 1999. (E)
18. Summary Report, 10<sup>th</sup> Session of the Panel of Experts on Forest Gene Resources (E), 2pp
19. Background note for Side Meeting on the Establishment of a Mahogany Network in the Neotropics, Latin American and Caribbean Forestry Commission, Havana, Cuba, 10-14 September 1998
20. Report from FAO on its Policies, Programmes and Activities on Plant Genetic Resources, presented at DIVERSITAS-Unesco/FAO/IPGRI/CBD Meeting "Conservation and Sustainable Utilization of the Genetic Resources of Wild Plants of Interest to Food and Agriculture". FAO 1998
21. CSIRO Division of Forestry and Forest Products (1998). Material Transfer Agreement
22. CSIRO Division of Forestry and Forest Products (1998). Background to the Decision by CSIRO Forestry and Forest Products to adopt a Material Transfer Agreement for despatch of forest genetic resources
23. CGIAR (1998). Position Statement on Genetic Resources, Biotechnology and Intellectual Property Rights, 19 May 1998
24. Report on Topic 8, XI World Forestry Congress, Turkey, Oct. 1997
25. Antalya Declaration, XI World Forestry Congress, Turkey, Oct. 1997
26. Brief Analysis of COP IV (Convention on Biological Diversity). IISD Bulletin, May 1998
27. CBD-SBSTTA IV and the Intersessional Meeting on the Operations of the Convention, Montreal, 21-30 June 1999: Agenda
28. International Conference on Biotechnology in the Global Economy, Harvard University, 2-3 September 1999
29. International Conference on Science and Technology for Managing Plant Genetic Diversity for the 21<sup>st</sup> Century, IPGRI, Kuala Lumpur, 12-16.6.2000

#### Technical Papers:

30. Palmberg-Lerche, C. and Ball, J.B. (1998). Present Status of Forest Plantations in Latin America and the Caribbean and Review of related activities in tree improvement. Invited paper. IUFRO/FAO Latin American Forestry Congress, Valdivia, Chile, Nov. 1998
31. Midgley, S. and Boland, D. (1998). Influences on the international exchange of forest genetic resources – an Australian perspective. Invited Paper, IUFRO All Division 2 Conference on Forest Genetics and Tree Improvement, Beijing, China
32. FAO (1998). Contribution of genetics to the sustained management of global forest resources. Invited Paper, IUFRO All Division 2 Conference on Forest Genetics and Tree Improvement, Beijing, China
33. Palmberg-Lerche, C. (1999). Conservation and management of Forest Genetic Resources. Journal of Tropical Forest Science, Vol. 11, No. 1, pp. 286-302
34. Cannon, C.H., Peart, D.R. and Leighton, M. (1998). Tree Species Diversity in Commercially Logged Bornean Rainforest Rainforest Science Vol. 281, pp. 1366-1368, Aug. 1998 (Extracts)
35. Haines, R.J. and Martin, B.E. (1997). Biotechnology and the Sustainable Production of Tropical Timber. Forest Genetic Resources No. 25, FAO 1997
36. Burdon, R.D. (1994). The Role of Biotechnology in Forest Tree Breeding. Forest Genetic Resources No. 22, FAO 1994

37. Williams, P.H., Gaston, K.G. and Humphries, C.J. (1994). Do Conservationists and Molecular Biologists value Differences between Organisms in the same way? Biodiversity Letters, Vol.2:67-78 (Extracts)
38. Lester, D.T. and Libby W.J. (1998). External Evaluation of Somatic Embryogenesis for Enhancing Genetic Gains from British Columbia's Tree Breeding Programmes. Forest Genetics Council of British Columbia, Canada, June 1998
39. Sharing the World's Genetic Resources, Nature Vol. 392, No. 525, 1998
40. UK's Only Genetically Modified Trees Destroyed by Activists. Environment News Service, 1999
41. Extracts on sustainable forestry from book to commemorate 25<sup>th</sup> year of Association Skogskultur, Finland, 1936
42. FAO Forestry Information Notes:
  - List of Notes;
  - Management of Forest Genetic Resources: their Conservation, Enhancement and Sustainable Utilization;
  - Regional Strategies and Action Plans on Forest Genetic Resources;
  - Panel of Experts on Forest Gene Resources

Miscellaneous:

43. Mandate of the FAO Panel of Experts on Forest Gene Resources
44. List of Members of FAO Panel of Experts on Forest Gene Resources
45. Responsibilities of Panel Members by region (internal note, FAO/FOR)
46. Secretariat Note FORGEN/99/3, "Follow-up to Recommendations of the Tenth Session of the Panel"
47. Provisional Agenda of International Technical Consultation on Protected Area Management and Sustainable Rural Development, Harare, Zimbabwe, 26-29 October 1999
48. Terms of Reference of Consultant for "Support to preparations for Sub-Regional Workshop on the Conservation, Management, Sustainable Utilization and Enhancement of Forest Genetic Resources in Sub-Saharan Dry-Zone Africa", 1997



## FOLD-OUT FLAP

### LEGEND FOR SPECIES LISTS

#### End uses

1. Industrial wood (logs, sawntimber, construction wood, plywood, chip and particle board, wood pulp etc.)
2. Industrial non-wood products (gums, resin, oils, tannins)
3. Fuelwood, posts, poles (firewood, charcoal, roundwood used on-farm, wood for carving)
4. Other uses, goods and services (food, medicinal use, fodder, land stabilization/amelioration, shade, shelter, environmental values). Complementary information is, at times, given in the "Remarks" column.

#### Exploration

5. Biological information (natural distribution, taxonomy, genecology, phenology etc.)
6. Collection of germplasm for evaluation

#### Evaluation

7. *In situ* (population studies)
8. *Ex situ* (provenance and progeny tests)

#### Conservation

9. *In situ*
10. *Ex situ*

#### Germplasm use

11. Semi-bulk/bulk seedlots, reproductive materials
12. Selection and improvement

#### Remarks

13. Specific uses not obvious from columns 1-4 are mentioned. Also, work in progress is reported in this column. For clarification, reference is sometimes made to a specific country.

PVT = provenance trials

PGT = progeny trials

CLT = clonal trials

SO = seed orchard

(E) = endangered at species or provenance level

MPTS = multi purpose tree species

\* \* \* \* \*

#### Rating

For columns 1-4: ✓ as appropriate

For columns 5-12:

1. Highest priority
2. Prompt action recommended
3. Important, but less urgent than (1) and (2)

