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European Tropical Forest Research Network

Programmes - Agenda - News

- 5th General Assembly ETFRN
- TREES ERS-1 STUDY ’94 - Assessment of the Usefulness and Relevance of Remote Sensing Satellite Data for Trees
The European Tropical Forest Research Network (ETFRN)

is an initiative of the European Commission, and was established in October 1991 in order to provide information and services to support research on tropical humid and dry forests. This includes all research areas related to the tropical forest environment.
The aim of ETFRN is to increase the cooperation and concertation of research institutions, governments and industry of European and tropical countries through well-targeted information management.
ETFRN organises and participates in workshops and seminars. It supports its participants in exploiting existing funding sources and in establishing research cooperations. It will use and support the development of a Global Tropical Forestry Research Information System.

Contents:

Organisations - Institutions - Programmes 1
Research Cooperations 15
News 16
Publications 21
Vacancy Announcements 24

Enclosure: International Agenda

Editors:

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European Tropical Forest Research Network (ETFRN)
c/o ATSAF e.V.
Ellerstr. 50
D-53119 Bonn
Tel.: +49-228-98 46-16
Fax: +49-228-98 46-99

Editor: Horst Freiberg
Editorial Coordination and Design: Monika Reule
Editorial Assistant: Isabel von Grapow

ETFRN-Newsletter 10/94
Organisations-Institutions Programmes

The Centre for Tropical Biodiversity

The Centre for Tropical Biodiversity is funded by the Danish Natural Science Research Council for the period 1993-1998. Being a "centre without walls", the funds are given for a multidisciplinary research programme that brings together the leading Danish research groups in the field. Denmark has a long tradition and international recognition in the study of biology, taxonomy, and evolution of tropical organisms. The purpose of the centre is to strengthen this position and to support innovative work by coordinating and supporting Danish research in the field of tropical biodiversity.

The centre will focus on the biota of montane and adjacent lowland forests in the Andes, East Africa, and Southeast Asia. Its objectives are:

- to document and compare patterns of diversity
- to analyse diversity through phylogenetic analysis of species
- to test models of diversification for population, species, and higher taxa.

In the process, data will be gathered on:
- systematics and geographical range of taxa
- biosystematic measures for ranking conservation needs in the context of current rapid destruction of tropical forests.

Through its interdisciplinary approach towards funding, the centre will bring together Danish taxonomists and ecologists studying tropical biodiversity in montane biota. The centre will identify common focal points for their research, train young scientists in methods at the forefront of biodiversity research, and increase the internationalization of Danish research in these fields by a guest programme, symposia, and workshops on fundamental issues. This will be crucial for the recruitment of talented young Danish scientists to the field.

The centre covers all fields of biodiversity: botany, zoology, ecology, molecular biology and population genetics. It will use techniques such as DNA sequencing, study and curation of prepared specimens in herbaria and museums, and theoretical modeling. Additionally, the centre represents the three main scientific museum collections of tropical organisms in Denmark.

Perspective

Biodiversity refers to the multiplicity of living organisms and can be recognized at three levels: genetic diversity, species diversity, and community diversity. Presently, the interest in biodiversity exceeds the level of scientific understanding as development agencies rush to plan sustainable management of the world’s resources. The rapidly diminishing tropical lowland forest has received the most attention, but the less extensive tropical montane areas may be even more important for diversification, and hence are the focal areas.
The research programme will analyse fundamental questions about patterns and causes of species richness, species abundance, and endemism.

Though not directly concerned with conservation, the research project will analyse questions of fundamental importance for long-term preservation of biodiversity. Current procedures for selecting areas of priority for conservation are unclear and contradictory. The International Union for Conservation of Nature (IUCN) and United Nations Environmental Programme (UNEP) strategies pay attention to the number of species per country, diverse ecosystems, species or genes in a given assembly, and areas with particular species richness and endemism; these are not always correlated and may imply different historical or ecological processes. Some experts give high priority to areas with many endemic species or to areas which were thought to be important for diversification. Rather than to give high priority to species richness, others choose areas with many relict species. Yet other models include different measures derived from topologies of phylogenetic trees.

New evidence suggests that the high species-richness in South America is the result of a recent radiation within the tropical Andean region and the western fringe of the Amazon Basin. In contrast the Afro-montane biota is ancient with a gradual divergence since the uplift 7-20 million years ago. Southeast Asia is geologically diverse as a result of several continental fragments having been brought together, giving rise to complex species interactions that may have had a considerable influence on both speciation and extinction. Comparisons within and between these areas, with their widely different histories and differences in diversity patterns, will yield valuable comparative information relating to all three areas, e.g., the enigma of circum-Pacific distribution patterns, and local versus universal causes of speciation. It will be possible to examine knowledge about how specific groups of organisms, e.g., trees and birds, can act as an estimate of the total biodiversity on different geographical scales.

**Research Programme: Finding patterns and testing models for diversification in the tropics**

By studying and comparing diversity in areas of well-documented geological history, the centre will contribute to the understanding of patterns and processes which maintain the function and structure of communities that differ in species complexity. This will be studied in an attempt to answer the general question: How are species distributed in tropical montane and lowland areas?

Three main models of speciation will be studied in relation to the above:

1) The high-altitude species have their closest relatives in the surrounding lowland biota, and differential selection has caused evolution of the high-altitude species;
2) The high-altitude species are remnants of a once continuous biota that has been fragmented by uplifting of mountain blocks; and
3) the high-altitude species are the result of alternate dispersions and range contractions caused by climatic fluctuations.

The three models generate different, testable predictions about phylogenetic relationships. Tests of these hypotheses require well documented phylogenetic trees, obtained by traditional morphological methods and DNA-sequence data, and subsequent analysis of the geographical pattern. DNA-data may also provide a rough estimate of the time sequences of events, and may indicate whether similar patterns in different groups reflect common history.

Data for evaluating the above will be obtained by studying:

**Biodiversity along gradients**

Community differentiation along gradients influences diversity patterns and contributes to diversification and speciation. Species richness, species abundance, and the distribution of plant lifeforms and families will be studied quantitatively along biotic gradients (e.g., altitude, latitude). The study of diversity along gradients will contribute to understanding the patterns and processes of significance in maintaining communities that differ in their degree of species complexity. In relation to the three models of speciation, speciation patterns along gradients will also be made, based on phylogenies of selected taxa (e.g., groups of flowering plants and birds).

Along altitudinal gradients in different regions, the general validity of the "hump-backed" species diversity- and productivity-curve will be studied in relation to recent theoretical developments.

**Biodiversity at different geographical levels.** Diversity pattern differ between small and large geographical scales. The importance of habitat differentiation for speciation will be studied in nested samples at the alpha-, beta- and gamma-level in tropical lowland and montane rainforests. Quantitative inventories will be used at the alpha-level, detailed floristic inventories at the higher levels.

**Impacts of fragmentation on speciation patterns and biogeographical patterns**

Fragmentation of populations is a generally accepted model of speciation. It may occur on different time- and geographic scales: continental drift and mountain building (millions of years), climatic changes (thousands of years), and current geomorphological processes, such as river dynamics (hundreds or tens of years). The importance of these processes for the diversification of species in South America, East Africa, and Southeast Asia will be studied using morphological and DNA-sequence data combined with cladistic and biogeographic analyses.

Comparing diversity patterns in groups with widely different phylogenetic histories and dispersal abilities (e.g., flies, spiders, birds, flowering plants), it may be possible to separate and estimate the importance of historical constraints and ecological effects for diversification.
In selected cases (e.g. African bovids) the effects of fragmentation will be studied at the population level.

**Differences in spatio-temporal patterns of diversification in the tropics**

For birds, the data of ca. 23,000 hybridizations of avian DNA and other systematic data are integrated to estimate the spatio-temporal process throughout the tropics. A pilot study of Africa and South America has already suggested a marked differentiation between areas where new species evolve (viz., the Andes and certain East African mountains) and others, where ancient diversifications accumulate. This could provide a basis for improving the understanding of these two basic processes.

**Importance of pollination mechanisms for speciation**

Pollination mechanisms are important for diversification but often not well understood. The pollination mechanisms of closely related groups of species will be studied, and correlations between evolution of different mechanisms and morphological differentiation will be tested.

**Other activities**

**PhD programme**

The budget includes grants for PhD students. It also includes funds for participation in international courses in tropical biology.

**Postdoctoral programme**

The centre will strengthen contacts with international partners by providing postdoctoral grants for two-year periods to promising Danish and foreign young scientists. The postdoctoral programme will furthermore keep young scientists attached to research during the transition between a completed PhD study and permanent employment.

**Guest programme**

Guest lecturers and senior scientists will be invited for shorter periods. Typically, each guest will be attached to one of the research groups, but within the framework of the proposed centre, it becomes natural to arrange visits to the other groups for lectures, discussions, etc. At the Institute of Biological Sciences (University of Aarhus), the guest programme is a continuation of a long tradition for guest lecturers in tropical botany. At the University of Copenhagen, the guest programme will be included in the lectures in tropical ecology.

**Workshops and symposia**

Workshops will be arranged with participation of colleagues from related research groups in Denmark and abroad. International meetings will be held to discuss and present results. Such symposia would be arranged by the steering committee of the Centre in collaboration with one or more of the participating research groups; they will also be arranged jointly with international partners.

For further information please contact:
Centre for Tropical Biodiversity
Henrik Balslev
University of Aarhus
Herbarium-Build. 137
DK-8000 Aarhus C, Denmark
Tel: (+45) 8942 2743
Fax: (+45) 8613 9326
In our Newsletter No. 5 from May 1993, we reported on the TREES (Tropical Ecosystems Environment Observations by Satellites) project, which was initiated in 1991 by the Joint Research Center of the Commission of the European Communities (JRC) in collaboration with the European Space Agency (ESA).

Now, JRC and ESA have decided to initiate the TREES ERS-I STUDY '94 with the objective to assess the usefulness of synthetic Aperture Radar (SAR) data provided by the European Remote Sensing Satellite No. 1 (ERS-1) for tropical forest studies under various ecological and environment conditions, and on a global scale.

**Background**

Monitoring of tropical forests has become an increasingly important issue in the past decade. Environmental considerations related to global change of the Earth's climate have been the prime force behind the attempts to improve the understanding of changes in the tropical forest cover. Logging, burning, shifting cultivation and natural hazards are causes for deforestation, most of which are anthropogenic. Although remote sensing with spaceborne data has more than two decades of experience the extent of tropical forests and particularly its rapid decrease are still not precisely known at present. One obstacle in the use of optical remote sensing is frequent cloud coverage in tropical areas.

Radar remote sensing instruments such as those onboard ERS-1 may provide a significant contribution towards an operational use of remote sensing data. Within the framework of TREES II (1995-98) such a global tropical forest monitoring system is developed based on the forest cover classification performed within TREES I (1991-94). In order to assess the potential of ERS-1 SAR data the TREES ERS-1 STUDY '94 was initiated.

**Past ERS-1 Studies within TREES**

In the past few years the use of ERS-1 SAR data within the TREES Project was concentrating on the development of technical tools for SAR data analysis. Emphasis was put into terrain geocoding, speckle filtering, texture analysis, signal calibration and SAR processing. In addition, a few application oriented investigations have been carried out based on two sites, one at the Ivory Coast (Sassandra) and one in Brazil (Acre).

**Objectives of the new study**

The major objective of the TREES ERS-1 STUDY '94 is to examine the potential of ERS-1 SAR data for tropical forest monitoring. The assessment will be geared towards an operational use of radar data. The principal goal is forest/non-forest discrimination. In addition, questions related to

- the use of ERS-1 for Advanced Very High Resolution Radiometer (AVHRR) validation,
- the use of ERS-1 as gap filler in cloud-covered areas, and
- and the usefulness of ERS-1 for operational deforestation monitoring are addressed. State of the art analysis tools will be compared.
Further, optimum timing and frequency of acquisitions, product types and analysis procedures will be recommended. The systematic assessment includes a great variety of ecological and environmental conditions.

**Study areas**
A total of 21 study areas along the tropical belt have been selected which represent different forest conditions in terms of forest ecology, forest density, deforestation states and terrain characteristics. The study areas, approx. 2 x 2 degrees latitude x longitude in size, are located in Latin-America, Africa and Southeast-Asia, respectively. In order to benefit from already existing expertise, study areas were selected, at which radar and/or optical data have already been investigated in past or on-going studies.

**Scientific issues to be tackled**
There is a great number of technical issues that will be addressed during this study. An overview of these issues is given below:

**Analysis techniques**
- calibration
- speckle filtering
- texture analysis + image segmentation
- classification techniques
- optical/radar data fusion

**Multi-temporal aspects**
- influence of meteorological conditions during acquisition time (i.e. rainfall, plant moisture, etc.)
- minimum/optimum number of acquisitions (e.g. for seasonal versus evergreen forest)

**Terrain geocoding**
- terrain geocoding with DEM
- merging of ascending/descending paths

**Towards operational applications**
- data reduction & data handling
- optimum product types
- optimum acquisition timing
- production of a regional mosaic
- change detection (deforestation monitoring)
- optical - radar information compatibility

**R & D issues**
- potential of interferometry for forest/non-forest discrimination and the meaning of coherence information over tropical forests
- backscatter modelling
- potential of large scale radar altimeter data

Emphasis will be put into terrain geocoding considering that hilly and mountainous areas are mostly covered by forests in the Tropics. Also, the potential of interferometry will be investigated, in particular the usefulness of coherence information for forest/non-forest discrimination.

A selection of above issues will be made for each study area, depending on the respective site’s characteristics.

**Outlook & future plans**
Based on this systematic ERS-1 data assessment under various ecological, environmental and geographical conditions general recommendations will be formulated regarding the usefulness of ERS-1 for tropical forest studies.
This assessment will, of course, also incorporate experience drawn from other studies outside this TREES ERS-1 STUDY '94.

In view of the expected operational use of ERS-1 data the possibility of creating an ERS-1 SAR mosaic over the Central African base is currently studied. For this purpose the acquisitions of the transportable station at Libreville Gabon, will be merged to create a regional mosaic. Single-date as well as multi-temporal mosaicking will be investigated.

Further, the potential of newly emerging analysis techniques such as interferometry or new classification methods are being investigated. The use of coherence information is expected to support thematic interpretation, particularly forest/non-forest discrimination. Also, the potential of information derived from radar altimeter data is assessed. The latter, however, addresses a different spatial scale caused by the instrument’s resolution in the km-range.

The recommendations retrieved from this analysis will largely benefit any development of an operational tropical forest monitoring system, as it is envisaged within the TREES II project.

For further information please contact:
J.-P. Malingreau
EC Joint Research Centre (JRC),
IRSA-MTV-TREES, TP440
21020 Ispra (VA)
Italy
Tel.: +39-332-78-9830
Fax: +39-332-78-9073

WEDNET (Women, Environment and Development Network) is an innovative research and information-sharing project of the Environment Liaison Centre International (ELCI) in Nairobi, Kenya. It is financially supported by the International Development Unit (GAD). The project was launched with a meeting in Nyeri, Kenya, in June, 1989 which brought together researchers, information systems and communication specialists to work out common methodological approaches for research and modalities for networking.

WEDNET has three inter-linked components. The major component is a multinational, multi-disciplinary research undertaking on "Women and Natural Resource Management in Africa". A total of 17 researchers in 8 African countries are involved in 10 research projects, using a common framework of investigation. This framework recognizes that the environment crisis in Africa and the poverty of African women are not distinct phenomena; they are the result of global and regional policies that force African women to transfer their own difficulties onto the environment as the long-term cost of their subsistence. In this setting, women’s knowledge of the environment has been undermined and trivialized.

WEDNET’s primary aim is to document and legitimize women’s indigenous knowledge, in both traditional and contemporary con-
texts, as part of the search for strategies which will halt Africa’s environmental degradation and bring about sustainable development.

The specific objectives of WEDNET are:
• to break the isolation of researchers, especially women, working on gender and environmental management;
• to develop a network of concerned researchers and grassroots groups as an integral part of the research on women’s knowledge and roles in natural resource management;
• to promote research on
  - spheres of knowledge about the environment;
  - household strategies for coping with environmental degradation; and
  - innovative strategies for sustainable resource management;
• through the research process, to forge collaborative links between researchers and policy-makers; and between researchers and non-governmental, voluntary agencies which are involved in enhancing the sustainability of the resource base of the poor;
• to produce a set of policy recommendations for more effective resource management which take account of women’s insights and experiences.

Research projects have now been funded from:
Burkina Faso: "Women, migration and environment"
Ghana: "Women and forestry resources in Ghana", "Gender and access to land: The interface between tenure and land use management in Ghana"
Kenya: "Women’s role in integrated water resource management"
Senegal: "Women’s knowledge of technology and production"
Sudan: "Women and food security in drought prone environments"
Zaire: "Kinshasa Women’s use of indigenous knowledge in child nutrition and health as a crisis survival strategy"
Zambia: "Pastoral women’s indigenous knowledge in livestock management"
Zimbabwe: "Women, household food security and wildlife resources," Indigenous science and technology in agriculture and food systems"

The second component of WEDNET endeavours to link up the researchers in a computerized network for purposes of information-sharing and resources input. The network’s objective is to:
- provide links between the researchers and the coordinating points (ELCI, Nairobi and the Faculty of Environmental studies, York University, Toronto);
- facilitate links between the researchers and selected documentation centres, particularly ELCI and IFAN (Université Cheikh Anta Diop, Dakar), which is the focal point for participants in Francophone West Africa;
- ensure the strategic and broad dissemination of network data, particularly through linkages with other active research and information networks.

The third component comprises a spin-off from the main research and information-sharing activities whereby effective ways and means are being developed for:
- communicating relevant recommendations to policy-makers;
- sharing action-oriented recommendations with NGO constituent members of ELCI; and
- strengthening grassroots women's efforts through the research findings.

WEDNET publishes a newsletter (WEDNEWS) as an on-going source of information on activities within the project and from the wider development community.

For further information please contact:
Rob Sinclair
Co-Executive Director
Environment Liaison Centre
P.O. Box 72461
Nairobi, Kenya
Tel: +254-2 562015/562022
Fax: +254-2 562175
E-mail: gn:elcidwr

or:
Dr. Bonnie Kettel
Canadian Coordinator for WEDNET
Faculty of Environmental studies
York University
North York, Ontario, Canada
M3J 1P3
Tel: +(416) 736-5252
Fax: +(416) 736-5679
E-mail: web-bkettel

In the last issue of the ETFRN-Newsletter we reported on the German "Initiative Tropenwald" and its efforts towards sustainable management of tropical forests and an internationally accepted certification system for timber production. There is a similar endeavour in the USA. The New York based NGO "Rainforest Alliance" runs two interesting programmes: Smart Wood and the Timber Project.

Smart Wood:

Smart Wood was established as the first independent forest management certification program in the world in 1990. The program is managed by a core staff of forestry specialists, with assistance from Smart wood advisors and local consultants and cooperating organizations in producing countries throughout the Americas, Europe, Asia, Africa and the Pacific. Smart Wood is part of the Rainforest Alliance’s ECO-OK product certification effort.

Purpose:
The purpose of Smart Wood is to provide objective third-party evaluation of forest products sources and companies, enabling consumers to identify products whose harvesting does not contribute to the destruction of forests. Smart Wood certifies forest products that come from "sustainable" or "well-managed" forestry operations, or "sources".
Sources could include a natural forest, a plantation, a large commercial forestry concession or a small-scale community project. Through certification, Smart Wood hopes to increase forest managers' incentives to adopt sustainable forestry practices that meet long-term environmental, economic and social needs.

Eligibility:
Smart Wood is a voluntary program working with forest industry, and wholesalers or retailers of forest products. All sources of timber, or companies involved in selling forest products, in all types of forests, are eligible to apply for certification. At the request of applicants, Smart Wood staff or advisors conduct a field evaluation (and subsequent field audits) of forestry activities, pertinent records and facilities as necessary to verify the quality of forest management at the source, or clarify the sources of a trading company's forest products. All information is held in strict confidentiality.

Cost:
All certified sources and companies are requested to pay an annual, non-reimbursable program management fee. In addition, costs incurred in the performance of assessments or audits are billed to the company or source. In the event that certification requires the auditing of additional companies (suppliers) and/or field audits of sources, the costs associated with such audits will be shared among participating companies. No organization shall be refused to participate in the program due to an inability to pay the annual management fee or cover certification costs. However, because Smart Wood must raise funds to cover such assessments, they will usually take longer to perform. All Payments made to Smart Wood are solely for the purpose of covering program costs.

Criteria for Certification:
Smart Wood certification is based on field review using either the "Smart Wood Generic Guidelines for Assessing Natural Forests", or, when available, country or region-specific guidelines. In general, candidate operations must meet the following broad principles:

1) maintenance of environmental functions, including watershed stability and biological conservation
2) sustained yield forestry production
3) positive impact on local communities

Smart Wood does not endorse the conversion of primary forest to plantations. The Smart Wood Generic Guidelines have been developed with help from professional foresters, ecologists and social scientists, and are constantly being revised. Smart Wood is also helping to develop forest management guidelines for particular bioregions and countries in consultation with local people, governments and non-governmental organizations (NGOs). In the past, draft guidelines have been developed for Indonesia. Guidelines for Belize, Brazil and Papua New Guinea are on the way.

Smart Wood Sources are certified according to how closely they adhere to the given principles and guidelines. A source operating in very strict adherence to these principles will be classified as a "sustainable"
source. Sources that can demonstrate, in the field, a very strong operational commitment to our principles and guidelines will be classified as "pre-certified members", but only after a field-level, pre-certification assessment has taken place. This type of program enrollment is a formal indication that the enrolled organization has received recommendations for improvements, supports certification, and is working to convert its operations to full certification. Smart Wood Companies are certified according to whether all or some of their wood products come from certified Smart Wood sources. An "exclusive" Smart Wood Company (Category#1) sells forestry products made exclusively from wood from Smart Wood sources. A "Non-Exclusive" Smart Wood Company (Category#2) sells products from both Smart Wood certified sources and other non-certified origins. Category 2 companies are encouraged to become Exclusive Smart Wood companies as quickly as possible.

Evaluation/Audit Process:
When a potential Smart Wood Source is first identified, an information search on that operation is conducted. In a few rare cases, where field evaluations have already been performed that adequately document the source's commitment to sustainable forestry, no additional field evaluations may be necessary. In most cases, Smart Wood will conduct an initial field evaluation, using its own staff or personnel from a cooperating regional or local organization, or independent consultants.

In all field evaluations, a local specialist from that country will be involved. Field evaluations are reviewed by Smart wood staff and members of an independent review panel. After input from review panel members, the Smart Wood Program makes a final decision as to certification. Whether certified as a Smart Wood source or company, periodic field audits are conducted. Separate Smart Wood company and source "Certification Assessment and Audit Protocols" provide more detail on field procedures.

Public Information:
All certified sources and companies appear on the periodically updated Smart Wood List. Pre-certified members, operations that have been subjected to a formal field assessment but have not yet been certified, do not appear on the Smart Wood list, but information on them can be obtained by contacting the program.

International Networking:
To facilitate evaluation and monitoring of sources, Smart Wood is developing an international network of certification professionals, called regional Forestry Field Agents, and local collaborating organizations. Information contact from local or regional organizations that are interested in collaborating on certification initiatives are welcome. Collaboration may include the design of a country or regional certification program, training of field staff in assessment and auditing procedures, joint development of country or regional guidelines, and joint identification or assessment of candidate forestry operations.
The Timber Project

Introduction:
The Timber Project was created in 1988 to determine the role that U.S. imports of tropical timber play in tropical deforestation, and what actions by consumers and businesses might promote forest conservation. Commercial logging does more direct damage to tropical forest than any other activity except agricultural conversion, which is frequently fostered by logging roads. Since 1988, the Timber project has become involved in public information and outreach on forest conservation and management and the use of wood products, forest policy reform, policy development and field monitoring in relation to forestry-oriented carbon offsets, and, since 1990, the Smart Wood Certification Program.

Policy Reform:
In April 1989, the Timber project convened a first-of-its-kind workshop in New York City, entitled "The U.S. Tropical Timber Trade: Conservation Options and Impacts". Participants represented conservation, business and government and academia from eight countries, including Indonesia and Brazil, probably the two most important countries in terms of tropical forests and the U.S. tropical timber trade. The use of boycotts as a conservation strategy received considerable attention. The workshop's consensus resolution did not endorse boycotts of all tropical timber products as a conservation strategy, but acknowledged that boycotts might be appropriate in selective cases.

The resolution called for support for the International Tropical Timber Organization (ITTO, a United National trade group with a mandate including conservation), model forestry projects, and realistic economic policies affecting forests, as well as for recognition of the rights of forest dwellers and the importance of non-timber forest products. Lastly, the resolution called for international agencies to "devise and promote an internationally agreed upon system for rating and documenting tropical timber production according to sustainability, and publicize these results". This was the starting point for the Smart Wood Certification Program.

The Timber Project remains involved as an observer in the deliberations of the International Tropical Timber Organization. The project had an important role in the creation of a new organization, the Woodworker's Alliance for Rainforest Protection (WARP), and in organizing the WARP I conference in November 1990. Since 1990, the Timber Project has been active in WARP, while at the same time encouraging complementary initiatives in the private and public sectors. The Timber Project has participated in the organization of the Forest Stewardship Council (FSC) as an oversight institution for certification organizations worldwide. The project has also contributed to incipient efforts by the International Hardwood Products Association (IHPA) and other organizations to improve the forest management practices of forest industries in the U.S. and elsewhere.
Forestry-Oriented Carbon Offsets:
The Timber Project is working with other environmental non-governmental organizations (NGOs) to investigate legislative actions or alternatives that will foster sustainable forest management. One alternative that is gaining increased attention is "carbon offsets", i.e. investments in the conservation and management of forests by electric utility and energy companies in recognition of the forest's value as a carbon sink for offsetting carbon emissions, especially in North America and Europe. Since November 1992, the Timber Project has participated in developing and implementing a field monitoring program for a pilot carbon offset project being conducted in Sabah, Malaysia, by a local forest industry with support from an U.S.-based electric utility company. The Timber Project is participating in dialogues for developing policies that encourage companies involved in offsets to have a balanced and credible effort in both energy conservation and forest conservation and management. The Timber Project supports and monitors research that will more definitively quantify and qualify the carbon cycle costs and benefits of forestry-related offset programs, as well as more definitive techniques for monitoring and verification of such initiatives.

Public Information:
In 1990, the Timber Project published "First Cut: A Primer on Tropical Wood Use and Conservation" (available from the Rainforest Alliance). The Timber Project is now producing a new primer which will cover similar and other new related topics, as well as a number of other publications in relation to forest management, conservation, and the use or trade of forest products. A list of these publications is available from The Rainforest Alliance offices in New York.

As is true of all Rainforest Alliance initiatives, the Timber Project is seeking sustainable economic alternatives which will improve the livelihood of people who live in and around all forests. To do so, the project is constantly searching for new and innovative ways in which technical specialists in all fields (e.g. ecologists, foresters, biologists, social scientists and economists), businesspeople, farmers and government representatives can collaborate to meet these objectives.

For further information please contact:
Rainforest Alliance
65 Bleecker Street
New York, NY 10012-2420
Tel: +212-677-1900
Fax: +212-677-2187

Botanical and Ecological Research at the Institute of Botany, University of Frankfurt, Germany

The research group "Geobotany and Plant-Ecology" belongs to the Institute of Botany (University of Frankfurt) and has existed in its present structure since 1988. The main research target is the analysis of man-made changes of vegetation in different biocones with emphasis on the following themes:
European Tropical Forest Research Network

- Urban vegetation
- Nature conservation
- Forest vegetation (espec. herbaceous layer)
- Ecology of air pollution effects
- Ethnobotany (espec. in West-Africa)

Since 1990 the Institute is involved in an interdisciplinary research project of the University of Frankfurt (SFB 268 "Development of culture and history of languages in the savanna zone of West-Africa") which is financed by the German Research Association (Deutsche Forschungsgemeinschaft, DFG). Together with disciplines like linguistics, ethnology, geography, archaeology and ethnobotany the research of the botanical institute focusses on the variations in the composition of vegetation due to different ethnospecific landuse-systems in the savanna zone of Burkina Faso and Nigeria. Current investigations concentrate on the analysis of ruderal and vegetale vegetation, useful plants (human nutrition, fodder plants, traditional medicine) and pasture ecology.

The most important partners within these research activities in Africa are the University of Ouagadougou (Burkina Faso), the University of Maiduguri (Nigeria) and the German Technical Agency (GTZ).

The Institute publishes the "Geobotanische Kolloquien" (German with English and French abstracts) which provides the results of speeches held at the Institute of Botany as well as the "Studien zur Flora und Vegetation von Burkina Faso und seinen Nachbarländern/Etudes sur la flore et la végétation de Burkina Faso et ses pays voisins" (German/French) which are dealing with current progresses in botanical research in the Sudan and Sahel-Zone of West Africa. They are available on request.

For further information please contact:
Prof. Dr. Rüdiger Wittig
Botanisches Institut
J.-W. Goethe Universität Frankfurt
Siesmayerstraße 70
Postfach 11 19 32
60054 Frankfurt am Main
Germany
Tel: +49-69-798 4739
Fax: +49-69-798 4822

The ASEAN-Forest Tree Seed Centre Project

The focus of the ASEAN Forest Tree Seed Centre Project is on the production, storage and distribution of high quality tree seed and on the production of planting stock for regional forestation.

The four main objectives of the Project are to conduct research and development, to provide operational support to ASEAN agencies, to facilitate information exchange and dissemination among ASEAN personnel, and to provide training to ASEAN personnel.

The Project is jointly funded by the Canadian International Development Agency with contributions from ASEAN-member countries and hosted by Thailand.
For further information please contact:
Mr Somyos Kijkar
Director
Asean Forest Tree Seed Centre Project
Muak Lek
Saraburi 18180
Thailand
Tel: +036-341-305
Fax: +036-341-859

Research Cooperations

Under this heading the ETFRN Newsletter offers its readers the possibility to write a short article for future issues of the Newsletter offering research cooperation opportunities.
Should you be interested in making your cooperation efforts known to the Newsletter readers, please feel free to send us your summaries.

Symbiotic Association of Two Woody Plant Species in Southern India

The Department of Botany of the University College Dublin is planning to conduct a research project under the title "Symbiotic associations of Alnus nepalensis and Elaeagnus latifolia: their interactions and their effects on tree growth, soil fertility and biodiversity in Southern India".

The leading scientists who are involved in the project are Professor R. Annamalai, IFS, Dean, Forest College and Research Insti-

ute, Tamil Nadu Agricultural University, India, and Dr. Derek Mitchell, Department of Botany, University College Dublin, Ireland.

General and long term objectives:
The research proposal focusses on the symbiotic associations of two woody plant species (Alnus nepalensis and Elaeagnus latifolia) planted in a fragile environment of Southern India. The fragile environment in the upper slopes of the Western Ghats in Tamil Nadu is subject to deforestation by fire and grazing pressure resulting in soil degradation and reduction in biodiversity. This work will provide evidence that the use of afforestation in the farming practices will lead to an improvement of soil fertility and stimulation of biodiversity. It is hoped that an increase in crop production will ensure without the necessity of applying expensive chemicals such as fertilizers.

Specific objectives to be achieved by the present project proposal:
This study will identify the symbionts (ectomycorrhizal and vesicular-arbuscular mycorrhizal fungi and N$_2$-fixing actinomycete Frankia sp.) associated with the roots of Alnus nepalensis and Elaeagnus latifolia growing in upland areas of Tamil Nadu. Representatives of these symbionts will be isolated and grown in culture. Root symbioses will be synthesized on A. nepalensis and E. latifolia and their effects on the growth and nutrient and phosphorus nutrition of the two woody species will be investigated. The importance of these symbioses on the growth and survival of A. nepalensis and E. latifolia on degraded soils in Tamil Nadu will be evaluated.
The department of Botany in Dublin is now looking for partners within the EU, who are interested in working on actinorhizal associations and other partners from Third World countries, who are interested in working on A. nepalensis and E. latifolia.

For further information please contact:
Dr. Derek Mitchell
Department of Botany
University College Dublin
Belfield,
Dublin 4
Ireland
Tel: +353-1-706 2254/2253
Fax: +353-1-269 4409
Telex: 326 93Ei

News

5th General Assembly of ETFRN

The 5th meeting of the General Assembly (GA) of ETFRN took place in Montpellier/France on June 24th, 1994. The main item of the Agenda concerned the ETFRN-Evaluation Report which aimed at adjusting the network’s objectives and organisational structure for the 2nd phase to the forthcoming 4. Research Framework Programme of the European Commission, DG XII.

The contract of the network was prolonged by the European Commission until December 1995. It was agreed that in the 2nd half of 1995, a larger evaluation will redesign the networks tasks and objectives for 1996 and the following years.

A modification of the network’s organisational structure was also introduced: A Policy Initiating General Assembly with the participation of DC research partners as well as International Organisations will meet on September 29th, 1995, in Vienna, Austria, in order to formulate the Terms of Reference for the forthcoming 2nd phase of the network. Furthermore, this Assembly will assist the network in its task of catalysing research cooperation linkages between European and Developing Countries and also in view of the European Commission’s intention to concentrate their efforts even more on local and regional tropical forest research priorities of DCs.

To supervise the work of the Coordinating Unit (C.U.) a Programme Advisory Committee (PAC) will be established, chaired by the responsible officer for STD (DG XII). The Chairman of the Policy Initiating General Assembly will also be Vice Chairman of the PAC.

The main tasks for the network and in particular for the C.U., until 12/95 are as follows:
• To organize and facilitate access to adequate information on research institutes, projects, scientists, cooperation, etc. In this respect the Coordinating Unit should act as an information node;
• To serve as a catalyst for cooperation and coordination;
• To bridge gaps between policy and science, (politicians, policy makers and researchers) and gaps between Europe and the Tropics;
• To represent the research community in the European Commission and at other occasions.

The participants of the GA also recommended to distinguish between objectives, tasks, mode of operation and organisation of the network itself, and the objectives and activities related to the formulation of a European Commission Research Strategy, including scientific advice on policy problems. For the latter, the network could be used to select specialists and organize meetings which will e.g. support the formulation of a research strategy.

Another item briefly discussed concerned the present state of data collection, processing and distribution by the AGREP database and the ETFRN/AGREP-Supplementary Data-Service-System.
It was agreed to proceed with the efforts to support the completion of the national data-sets related to tropical forest research projects, organisations and scientists, and to foster the data-flow into the AGREP database.

CODA: A Software Package for Designing Networks of Nature Reserves

CODA is an interactive map-based software package for designing networks of nature reserves or managed areas. The first version of CODA was developed in Australia in 1990 with the support of the New South Wales National Parks and Wildlife Service. It has been used for major reserve planning projects, off-park conservation planning, and as a research and teaching tool.

The basic strategy in CODA is to define conservation objectives, devise an initial proposal, and then use CODA’s decision support functions to explore options by systematically modifying the proposal.

The basic conservation objectives define what number or extent of each natural feature (e.g. species locations, vegetation types) is required in reserves or managed areas. An initial proposal is then derived by choosing a set of sites that contain the required amount of each feature. Since most conservation planning exercises have constraints imposed on the total area or cost of proposals, CODA provides selection functions that search for the smallest or close to smallest, set of sites that can meet the representation objectives. An initial proposal derived from an external program or expert analysis can also be imported into CODA.
Modifying the initial proposal with CODA’s decision support functions allows to explore options for the size, shape and make-up of the conservation network. During this stage CODA displays a map of the study area. Sites can be added to, or be removed from the network by pointing to them on the screen, or by using CODA’s automatic search and replacement functions on individual sites or groups of sites. At each step the process can be controlled and the consequences of each decision can be added directly in terms of data and conservation objectives. If a site in the initial conservation proposal is unsuitable for some reason, CODA can be asked to search for another site or combination of sites to replace it.

An example application
The New South Wales National Parks and Wildlife Service used CODA to develop conservation proposals for the eucalypt forests of the Eden region in 1990. This region occupies 7 800 square kilometres in the south-east of the state and has been the site of considerable land management conflicts between conservation and forestry interests.

The exercise began by defining the four data layers used by CODA.

Conservation data base:
Detailed information on the majority of the region’s biota was lacking, especially for fauna. The data base for this exercise thus consisted of two data sets:

- A map of 109 ‘environmental domains’ derived from a classification of climatic, terrain and soil variables; and known locations of species and plant communities of particular conservation significance.

Selection units:
These are the parcels of land to be examined during the analysis. For this exercise the region was divided into 590 stream catchments with a median area of 1000 ha.

Units of cost:
These are the currency used to measure the cost of conservation proposals. Ideally, the cost of reserves in the Eden region would be measured in terms of the timber resource affected since forestry is the chief land use in the region. However, these data were unavailable so the area of selection units was taken as the reservation cost.

Land suitability data base:
Maps of vegetative cover and degree of disturbance were used to compare the suitability of alternative sites for the reserve network.

Next, six objectives were defined for the exercise.

Representation objectives:
1. To represent each rare species or community in at least three catchments in reserves.
2. To represent a minimum of 1000 ha plus 5% of the remaining extent of each environmental domain in reserves.
Reserve design objectives:
3. Where possible, to plan reserves with
low perimeter to area ratios and a high
degree of connectivity.
4. Were possible, to choose the most un-
disturbed sites for reserves.

Objectives to make the proposals defensi-
ble:
5. To minimize the total area of new re-
serves.
6. Where possible, to reserve publicly
owned land to minimize acquisition
costs.

Next, one of CODA’s selection functions
was used to generate an initial conserva-
tion plan. This consisted of a set of catch-
ments in which the environmental domains
and rate species were fully represented.
The total area of this set gave an indication
of the minimum area that would be re-
quired for new reserves. Catchments in the
selected set that were contiguous with ex-
isting reserves and on relatively un-
disturbed, publicly owned land were added
to the reserve network. Replacements were
sought for the remaining catchments using
CODA’s decision support functions. During
this stage, the objectives of reserve shape,
connectivity and land suitability were ad-
dressed.

The result of the analysis showed that
26% of the Eden region was required to
fully represent the environmental domains
and rare features.

Benefits to conservation planners
The strength of the CODA procedure lies in
its explicitness, simplicity and flexibility.

The techniques employed in the package
are powerful yet conceptually straightfor-
ward. This not only has clear advantages
for the user, but also ensures that propos-
als developed using CODA, and the proce-
dure itself, can be readily explained to, and
even repeated by others. Parameters can
be set to address a broad range of conser-
vation objectives. Where two or more ob-
jectives are in conflict, alternatives can be
displayed and evaluated. Where constraints
are imposed on the planning exercise, such
as cost limits or the exclusion of certain
sites, their effect on conservation objec-
tives can be demonstrated.

Further information, references, and CODA
software can be obtained from:
Michael Bedward
c/o Environmental Survey and Research
Branch
NSW National Parks and Wildlife Service
P.O. Box 1967
Hurstville NSW 2220
AUSTRALIA
Fax: +61 2 585 6495

'Bioline Publications' is a new online biblio-
graphic service, focusing on biotechnology,
biodiversity, bioinformatics and biopolicy. It
incorporates commercial and not-for-profit
journals, as well as reports and newslets-
ters.
European Tropical Forest Research Network

Aware that access to scientific journals is often limited for reasons of cost, and that the existence of valuable reports and newsletters is often unknown, Bioline Publications aims to make scientific papers and important documents more readily available and at as low a cost as possible.

The service uses the Internet network and is accessible through a number of access routes to suit all levels of technical sophistication (World Wide Web, Gopher, Telnet and e-mail). All abstracts, summaries of reports and contents lists of newsletters are available free to all 'readers'. This part of the system can be browsed, using the easy-to-use gopher menu system, or searched for specific topics of interest.

If full text and graphics are required, subscription is necessary. For access to full text and graphics of all reports, newsletters, conference proceedings and non-commercial journals, the cost is $50/annum. Subscription levels to commercial journals are in most cases substantially less than the printed version. There are no other costs made for the service.

Documents can be requested online (selecting either text, line drawings, photographs or all files) and are mailed to the subscriber's personal e-mail address. Institutional/department subscriptions are possible, still with delivery to selected individuals if preferred.

In addition to the main document delivery service, it is possible to link directly from the main menu to other Internet bibliographic services. Downloading appropriate software (for management of graphics, efficient use of the gopher system) is also possible directly from the menu.

A Bioline-L (electronic Bulletin Board) has been set up for readers; this is used to announce new material, system up-grades or to discuss developments. Over 200 people from 34 countries are subscribed to this (free) list.

Since the launch of the system at the end of November 1993, there has been considerable interest shown by the Internet community. Additional material is continually being made available and discussions with further commercial publishers are underway. The ETFRN-Newsletter is on the way to be included. At present, there is no charge for making material available on the system and information providers should contact Bioline Publications if they have appropriate material that they would like to distribute electronically.

For further information please contact:
Barbara Kirso
Bioline Publications
Stainfield House
Stainfield
Bourne
Lincolnshire PE 10 0RS
United Kingdom
Tel: 44 778 570618
Fax: 44 778 570175
E-mail: bio@biostat.demon.co.uk
The national studies evaluate the extent and ecosystem coverage of protected areas and hence the degree to which these alone would ensure the maintenance of viable populations of all animal and plant species. The main emphasis of the studies is, to determine the extent to which forests, managed for timber and other forest products can complement protected areas by favouring the maintenance of larger population sizes and more extensive ranges of forest species. Emphasis is therefore given to determine the legal and effective security of production forests, their spatial relationship to protected areas, the probable impacts of management systems on biological diversity and the overall extent to which production forests do satisfactorily enhance the biodiversity conservation functions of protected areas.

As a result one can say that there is probably no country where the coverage of protected area is adequate to ensure the maintenance of all biological diversity. The way in which production forests are managed at present is unsatisfactory and inimical to the objectives of biological diversity conservation.

The book recommends a set of guidelines for the management of production forests which, if observed and monitored, would allow for recognition of a network of forest areas throughout the tropics managed, in an exemplary fashion.


The book is an attempt to determine whether the member countries of ITTO have a legal and administrative basis for managing their production forests in ways which will allow these forests to contribute to biological diversity conservation. The study also attempts to assess the extent to which such biodiversity-friendly management is already applied on the ground. For each member country, studies were commissioned on the situation of production forests, their spatial relation to the totally protected area system and the extent of knowledge of the impacts of present management on biological diversity. These country studies were presented at a workshop held during the IUCN General Assembly, in Perth Australia, in December 1990.

The document reports on the present state and future potential of biotechnologies in forest tree breeding, with special reference to their application in developing countries. It concludes that new technologies offer possibilities that will greatly facilitate the work of the tree breeder in future, but stresses that potential gains can only be realized if the technologies are based on thorough biological, genetic and silvicultural knowledge of concerned species and applied within existing, sound tree-improvement programmes. The technologies examined include:

- Cryopreservation and in vitro storage; molecular markers; genetic engineering; somaclonal variation; protoplast fusion; gametophyte cultures; in vitro embryo rescue; micropropagation; and in vitro control of the maturation state.

(from the backcover)


This textbook discusses in detail various aspects of nitrogen-fixing trees (NFTs), including species selection, plant inoculation, growth characteristics, cultivation practices and potential uses. It lists the tree species that currently are recognized to fix nitrogen, pointing to areas where further research is needed. And, in acknowledgement of an age where eroding lands and impoverished soils have given rise to the expression "endangered spaces," it provides information on successful management strategies that apply to soil improvement.

In the course of this discussion, the author also dispels some of the commonly held myths about this group of plants so that their real potential can be better realized. All of this information can be applied directly to tropical issues such as sustainable land use and reforestation of environmentally sensitive areas.

(from the preface)

A 'woody plant revolution' needs to take over where the 'green revolution' left off. Throughout the tropics there are numerous perennial woody species that have provided indigenous peoples with many of their needs for millennia: fuelwood, poles, timber, fruits, gums, nuts, resins, fibre, pharmaceutical products, etc. These trees are cut down indiscriminately and are often commercially ignored in favour of a handful of exotic species. The aim of an international 1993 Conference organised by the Institute of Terrestrial Ecology was to draw attention to a growing effort to domesticate a much wider array of genetically rich tree species and introduce them into agricultural and forestry systems. The techniques described in this Conference proceedings aim to solve the biological issues which until now have stood in the way of the rapid domestication of tropical trees. (from the backcover)


This book aims to give a concise presentation of mangroves and the problems of their conservation in Africa and Madagascar. It proposes, where possible, the actions required to preserve mangroves and rationally develop those regions where they grow. The book also looks in detail at the specific problems related to mangroves in seven African countries and Madagascar. For this reason it should be of interest to all those working in, or having dealings with, countries or regions where mangroves grow.

The book has been written for a wide audience and is not specifically directed at mangrove specialists. It does aim, however, to be of use to them by including an extensive bibliography; this should help researchers pursue any of the different aspects of the subject raised in the book. (from the preface)
Vacancy Announcements

ICARDA: Science Editor

ICARDA, one of 18 international centres supported by the Consultative Group on International Agricultural Research, cooperates with national programs in West Asia and North Africa (WANA) to develop sustainable improvements in dryland cereals, food legumes, farm resource management, and pasture, forage and livestock production. ICARDA’s multidisciplinary staff of over 450 senior scientists and support personnel has an international mandate for barley and lentil production improvement and with other centres, a joint regional mandate for wheat and chickpea production improvement.

The Position
The position is designed for an enthusiastic and self-motivated person who is committed to the profession and is ambitious of enriching his/her experience in an international environment. The candidate will be expected to work under pressure, and with a minimum of supervision. The position requires practical experience in computerized wordprocessing and a sound knowledge of modern prepress technology. Specific responsibilities will cover the editing of research reports, training manuals, workshop proceedings and other publications of ICARDA, as well as journal articles and other manuscripts submitted by the Center’s scientists to external publishers.

Experienced in teaching short-term courses in scientific writing would be an added advantage.

Qualification
Ideally, candidates will have a Bachelor’s degree (Master’s will be preferable) in agriculture or a related discipline, and a degree or equivalent practical experience in journalism with emphasis on editing and publishing. Ability to work as a team member with colleagues of different nationalities and cultural backgrounds.

Benefits
The salary is paid in US Dollars based on experience and qualifications. Benefits include housing allowance, paid home leave travel, a contributory savings scheme, vehicle, and free enrollment for dependents in the ICARDA-administered International School.

Application
Qualified applicants are invited to send:
1) a curriculum vitae with recent salary history;
2) names, addresses, and telex numbers of three professional referees to:

The Personnel Officer
ICARDA
P.O. Box 5466
Aleppo, Syria
Tel: (+963-21) 213433 or 213477
Fax: (+963-21) 213490 or 225105

Reference: Please quote position no. DG/7/94 on application.
Application deadline: Position open until a qualified candidate is identified.
European Tropical Forest Research Network

Just arrived!!!

International Plant Genetic Resources Institute (IPGRI): Coordinator for the European Forest Genetic Resources Programme (EUFORGEN)

The International Plant Genetic Resources Institute (IPGRI) is based in Rome/Italy and is supported by the Consultative Group on International Agricultural Research (CGIAR). IPGRI’s mission is to strengthen the conservation and use of plant genetic resources worldwide with special emphasis on the needs of developing countries. Funds are provided by more than 20 national governments and the World Bank. The following scientific position is currently available:

Coordinator for the European Forest Genetic Resources Programme

Responsibilities: Under the supervision of IPGRI’s Regional Director for Europe and the overall guidance of the Management Committee, the coordinator will:
- provide logistic support to the networks
- play the role of facilitator and secretary in the network meetings
- liaise between the different networks
- maintain close contact with the national coordinators
- prepare reports of network meetings and reports on activities and finance
- gather and disseminate relevant information to member countries
- contribute to raising public awareness of the importance of forest genetic resources conservation
- link with all thematic and regional groups within IPGRI and relevant activities and projects of other organizations with special reference to FAO

Requirements: University degree in forestry or in biological or agricultural science with work experience in forestry. Good understanding of general principles of forest genetic resources conservation and use. Excellent written and oral communication skills. Experience in network coordination desirable. Fluency in English and a second major European language. Knowledge of other European languages is an advantage.

Benefits: Internationally competitive package, including pension, insurances, education assistance, cost of living and housing allowances.

Closing date for applications:
15 September 1994

Estimated starting date: December 1994

Please send detailed CV and application letter to:
Dr. Masa Iwanaga
Deputy Director General - Programme IPGRI, Via delle Sette Chiese 142
I-00145 Rome
Tel: +39-6-51 89 22 00
Fax: +39-6-57 50 30 9
E-mail: IPGRI@CGNET.COM

10/94 ETFRN-Newsletter

25
The following organisations act as National Nodes to the European Tropical Forest Research Network:

**Austria:**
- Institut für Waldökologie, Universität für Bodenkultur Wien, Peter-Jordan-Str. 82, A-1190 Vienna. Tel: +43-1-47 65 4-41 00, Fax: +43-1-47978 96, contact: G. Glätzel

**Belgium:**

**Denmark:**
- Danish Centre for Tropical Agriculture & Environment, Royal Veterinary University, Rolighedsvej 23, DK-1898 Frederiksberg C. Tel: +45-35 28 34 29, Fax: +45-35 28 34 28, contact: K. Brün

**Finland:**
- University of Helsinki, Dept. of Forest Ecology, Tropical Silviculture, Vikinkatu 2, SF-0014 University of Helsinki. Tel: +358-0-70856 43, Fax: +358-0-70856 46, contact: M. Kanninen

**France:**
- CIRAD-Forké, 45 bis, Avenue de la Belle Gabrielle, F-34736 Nogent/Marne cedex. Tel: +33-1-43 94 43 62, Fax: +33-1-43 94 43 81, contact: F. Grison

**Germany:**
- Bundesforseuchsforschungsförderung, Leuschnerstr. 91, D-21031 Hamburg. Tel: +49-40-739 62-100, Fax: +49-40-739 62-480, contact: J. Heuveldop

**Greece:**
- Directorate of Forest Resource Development, Section of Forest Research, Ippokratos St. 3, GR-10164 Athens. Tel: +30-1-362 12 90, Fax: +30-1-360 71 38, contact: N. Efstratiadis

**Ireland:**
- Council for Forest Research and Development, Agriculture Building, University College Dublin, Belfield, IRL-Dublin 4. Tel: +353-1-70877 00, Fax: +353-1-70811 80, contact: F. Mulloy

**Italy:**

**Netherlands:**
- Tropenbos, P.O. Box 2 32, NL-8700 AE Wageningen. Tel: +31-63 70-262 62, Fax: +31-63 70-230 24, contact: E. Lammerts van Baren

**Norway:**
- Norwegian Centre for International Agricultural Development, Agricultural University of Norway, P.O. Box 50 02, N-1432 Aas. Tel: +47-64-94 88 24, Fax: +47-64-94 07 80, contact: E. Stjøthoom

**Portugal:**
- Tropical Forestry Centre, Tapada da Ajuda, P-1300 Lisbon. Tel: +351-13 97 32 06, Fax: +351-13 97 31 83, contact: R.M. de A. Sardinha

**Spain:**
- CICYT, Calle Rosario Pino 14-18, E-28020 Madrid. Tel: +34-1-577 00 98, Fax: +34-1-571 57 81, contact: J. A. Muñoz Delgado

**Sweden:**
- Natural Resources Management Institute, Stockholm University, S-10691 Stockholm. Tel: +46-8-16 12 90, Fax: +46-8-15 59 87, contact: M. Kægl

**United Kingdom:**
- UK Tropical Forest Forum, c/o Royal Botanic Gardens, Kew, Richmond, UK-Surrey TW9 3AE. Tel: +44-81-332 62 99, Fax: +44-81-332 62 84, contact: J. Thornback

**European Union:**
- Commission of the European Union, DG XII/8-4, Rue de la Loi 200, B-1049 Brussels. Tel: +32-2-236 44 84, Fax: +32-2-236 62 62, contact: K. Basse

10/94 ETFRN-Newsletter