

PN-ABC-644

61262

ICRAF / DSE INTERNATIONAL
WORKSHOP ON PROFESSIONAL
EDUCATION IN AGROFORESTRY
REPORT

6 - 10 December, 1982

Nairobi

KENYA

January 1983

I N D E X

	<u>Page</u>
1. Introduction	1
2. Workshop Objectives	3
3. Daily Programme of Work	4
4. List of Participants and Contributions	5
5. The Workshop in Pictures	15
6. Working Groups' Recommendations	19
7. Summary of the Workshop Evaluation	30
8. Appendix 1	32
9. Appendix 2	35

Workshop Organizers

Peter Huxley
ICRAF
P.O. BOX 30677
Nairobi, KENYA

Ester Zurberti
ICRAF
P.O. BOX 30677
Nairobi, KENYA

Olaf Anders
DSE
Wielinger Str. 52
D 8133 Meldafing
FEDERAL REPUBLIC OF GERMANY

How do we
Start
Teaching about
all this?



INTRODUCTION

The practice and science of agroforestry is an approach to more balanced land management based on the idea that a well conceived introduction of woody perennials in the agricultural landscape may enhance both the productivity and sustainability of land use systems.

In many tropical and sub-tropical regions widespread devastation of land resources is being caused through the increased in numbers of both man and his animals, and methods of soil management which promote ecological degradation in these fragile ecosystems. Furthermore, although conventional forestry practices designed to produced timber and wood products can certainly conserve the environment, they provide little food for the human settlement residing in or near them. And where some form of shifting agriculture is practised in such forested regions the "forest fallow" period has now, perforce, often been dangerously shortened, with consequent land deterioration. Even on many of the more productive arable soils in the tropics we know that continued cultivation and cropping will result in an insidious loss of soil fertility.

In all of these situations, well planned agroforestry should be considered as a potentially more productive and land conserving alternative. Indeed, in many parts of the tropics and sub-tropics indigenous rural inhabitants have, themselves, worked out systems in which the environmental benefits of trees and shrubs are combined with the production of agricultural crops, either on or within the same unit of land.

Animals may or may not be part of such systems. This approach to land use offers a chance to halt, or even reverse, the detrimental trends imposed on the environment by many current systems of production. However, if we are to set about improving existing agroforestry systems we must survey and study them critically. Furthermore, a 'new' and integrated approach is required in order to mould existing knowledge and technologies into suitable tools with which to manage agroforestry systems effectively and to design new ones.

If such opportunities to manage land appropriately in the tropics are to be grasped, where are the people to come from who can integrate the several disciplines and skills which together must be combined and re-formed into this 'new' approach? Are we to take existing foresters, agriculturalists and other experienced in specific areas of land utilization and land management, and "re-train" them? Should agroforestry be introduced alongside conventional courses or programmes? Do we have a need to raise a new generation specially trained in agroforestry *per se*? If we do, then have we enough practical information to train agroforesters at a technical and management level, or are we better able just to elaborate and inculcate the principles and scientific concepts at this stage? All these and other questions need clarification if appropriately-educated personnel are to become available in time, and in sufficient numbers, to deal with the developing thrust towards agroforestry which is now apparent throughout the world (see Proceedings of Seminar on International Co-operation in Agroforestry, DSE/ICRAF, July 15-23, 1979, Nairobi).

ICRAF, together with the German Foundation for International Development, undertook the responsibility of organizing an International Workshop on Professional Education in Agroforestry in Nairobi, December 6 - 10, 1982, to address the problems outlined above and to assess possible courses of action and priorities in relation to middle higher level agroforestry education. Seventy participants - from national as well as international organizations - attended the meeting covering the following geographical regions: North America, Latin America, Australia/New Zealand/South Pacific, Western Europe, Africa (Francophone), Africa (Anglophone), North Africa/Middle East, Indian Sub-Continent and South-east Asia. The professional expertise represented not only appropriate academic level in teaching relevant subject matter, curriculum development, planning and implementation of educational programmes but also covered agroforestry, agriculture, forestry, ecology/biology, land-planning, land resource management and education specialists.

The Workshop was structured to include brief formal presentations by the regional coordinators, followed by working group sessions alternated with plenary meetings. Six working groups met to discuss topics related to the present overall situation - common problems and constraints - of agroforestry education at the regional level; career prospects; existing programmes; new programmes; course contents and teaching methods; and, reviews of source materials for teaching.

Three kinds of resource documents were available to all participants during the Workshop:

- regional submissions (summarizing existing information on activities and plans concerning the teaching of agroforestry at a professional level in the main geographical regions of the world);

- position papers (on topics related to the main objectives of the workshop with the purpose to focus working groups' discussions or stimulate new ideas);
- reviews on subject material (mainly annotated lists describing the scope and merits of material at present available for teaching agroforestry).

Additional information was provided by means of a display of available publications in agroforestry and related fields. The display included brochures, booklets, books, hand-outs, posters, etc. See the list of publishers contacted in the Annex 1.

In the following pages, information is presented on the workshop objectives, daily programme of work, list of participants together with the titles of their contributions, and a summary of the working groups' recommendations. Also included is a summary of the evaluation procedures carried out to obtain participants' opinions on the achievements and general organization of the workshop.

ICRAF is grateful to the Deutsche Stiftung Fur Internationale Entwicklung (DSE) for assisting with the organization and a major funding contribution. And also to the Ford Foundation, the Beijer Institute and the Dutch Government for providing additional funds. Printed proceedings are to be published by ICRAF towards the end of 1983.

2. EDUCATION WORKSHOP OBJECTIVES

These were to debate the issues below, set down priorities and to formulate plans and procedures for future actions:

a) Assess type of manpower requirements needed and review present and future requirements for professional agroforestry education

That is to:

- i) assess, as far as possible, types of agroforestry inputs and services for which professional agroforesters are or will be required, and relate these to the teaching elements and structures required in educational programmes or courses for such personnel.
- ii) review the extent to which the elements of agroforestry are already taught either directly in agroforestry programmes or courses, or through other subjects such as agriculture, forestry, ecology, applied biology, resource planning, etc;

b) Review the appropriate forms of teaching and particular institutional requirements for adopting agroforestry. That is to:

- i) formulate the types of courses or programmes best-suited to particular kinds of institutes/faculties; and,
- ii) evaluate the capabilities and requirements of the various kinds of institutes/faculties to initiate teaching in agroforestry, and summarize the effects of such introductions on present education in land-use and land management subjects.

Taking into consideration the answers to (a) and (b) above, and the priorities selected:

c) Examine the details of how best to achieve the education required.

Through:

- i) a review of what material is available for teaching agroforestry either directly, or after suitable modifications;
- ii) outlines of the contents of programmes/courses and an examination of regional requirements;
- iii) an assessment, with priorities of the need for further teaching material (texts, manuals, visual aids, etc).

3. DAILY PROGRAMME OF WORK

		Plenaries at Safari Park Hotel			Working Group Sessions at Induville			
		SUN. 5 DEC	MON. 6 DEC	TUE. 7 DEC	WED. 8 DEC	THUR. 9 DEC	FRI. 10 DEC	SAT. 11 DEC
MORNING	Participants arrive and Registration		Complete registration	<u>Display</u>	<u>Display</u>	<u>Plenary</u>	Final meeting of Working Groups and typing of reports	AGRO - FORESTRY
	Working group Chairmen's meeting		Workshop <u>Objectives</u> (Plenary) Summaries or Regional Coordinators work	Working group Sessions Introduction to Resource Documents	Working group Sessions	Working group Sessions		
AFTERNOON	Working group Chairmen's meeting		Identification of working groups	Working group Sessions	Chairmen & Rep. Meeting	Final Drafts of Resource Documentation & Recommendations	(Plenary) Summary of Resource Documents and Recommendations	FIELD DAY
			<u>Display</u>	Plenary	FREE TIME		Field Trip <u>Information</u> Workshop Evaluation	
EVENING	Reception and opening ceremony		Meetings with working group Chairmen and Rapporteurs	Meetings with working group Chairmen and Rapporteurs		Meetings with working group Chairmen & Rapporteurs <u>Slide Show</u>		Participants leave

LIST OF PARTICIPANTS AND CONTRIBUTIONS

<u>Regional Coordinators</u>	<u>Summary of Regional Information from:</u>
1. Abdul Manap Ahmad Dean, Faculty of Forestry University Pertanian Malaysia Serdang, Selangor MALAYSIA	SOUTH EAST ASIA
2. Gerardo Budowski Head, Renewable Natural Resources Department Centro Agronomico Tropical de In- vestigación y Enseñanza (CATIE) International Coordinator for Agroforestry United Nations University Apdo. 74 Turrialba COSTA RICA (Tel: 566021)	CENTRAL AMERICA
3. Jean Dubois IICA-TROPICOS C.P. 2044 (Sao-Bras) 66000 Belem, Para BRAZIL (Tel: 091/2264318)	SOUTH AMERICA
4. Francis Halle Laboratoire de Botanique Institut Botanique 163 Rue Auguste-Brossonet 34000 Montpellier FRANCE (Tel: (67) 41-37-48)	WEST EUROPE
5. N.J. Joshi Deputy Inspector General of Forests 149 Krishi Bhawan New Delhi 110001 INDIA	ASIAN SUB-CONTINENT
6. Marwan R. Kamal Dean, Faculty of Agriculture Jordan University P.O. BOX 1682 Amman JORDAN	NORTH AFRICA/MIDDLE EAST
7. Martin L. Kyomo Faculty of Agriculture, Forestry & Veterinary of Dar-es-Salaam Sub Post Office University Morogoro TANZANIA	AFRICA (ANGLO PHONE)

8. Francois Mergen
Yale University
School of Forestry & Environment Studies
Greeley Memorial Laboratory
370 Prospect Street
New Haven, Connecticut 06511
U.S.A.

NORTH AMERICA

9. S. Dennis Richardson
C/o National Forestry Council
P.o. Box 5052
Lambton Quay
Wellington
NEW ZEALAND

AUSTRALIA/NEW ZEALAND/
SOUTH PACIFIC

10. El-Hadji Sene
Director of Forest Department
Hann Park, B.P. 1831
Dakar
SENEGAL

AFRICA (FRANCO PHONE)

Contributors of Position Papers

Titles

11. Soekiman Atmosudaryo
Faculty of Forestry
University of Mulawarman
Samarinda East Kalimantan
INDONESIA

Education and training
on the rural community
development.

12. Emiliana N. Bernardo
Visayas State College
of Agriculture
Baybay Leyte
PHILIPPINES

Need for an agroforestry
curriculum in the Philip-
pines.

13. Eberhard F. Brunig
Institute/Chair for
World Forestry
University of Hamburg
Leuschenerstrasse 91
D-2050 Hamburg 80
FEDERAL REPUBLIC OF GERMANY
(Unable to attend)

The network and twinning
concepts of research and
training: What do they
mean to education in agro-
forestry?

14. Jeffrey Burley
Department of Agriculture &
Forest Sciences
University of Oxford
South Parks Road
Oxford OX1 3RB
ENGLAND

Agroforestry course studies
and context at the degree
and post-graduate course
level.

15. Peter von Carlowitz
ICRAF
P.o. Box 30677
Nairobi
KENYA

Concepts and constraints of
education in agroforestry.

16. Linda Christanty
Institute of Ecology
Pajadjaran University
Jalan Schela
Bandung
INDONESIA

(Current address: Resource
Management Sciences
University of British Columbia
in Canada)

Traditional agroforestry systems in West Java, Indonesia.
17. Oghenetsavbuko T. Edje
Crop Production Department
University of Malawi
P.o. Box 219
Lilongwe
MALAWI

Agroforestry programme and agroforestry education in Malawi.
18. Eduardo E. Escalante
Apartado Postal 197
Trujillo, Estado Trujillo
VENEZUELA 3102-A

Guidelines for an agroforestry educational program in Venezuela.
19. Dan M. Etherington
Development Studies Centre
The Australian National
University
P.o. Box 4
Canberra ACT 2600
AUSTRALIA

Education in the economics of agroforestry land use systems: Economics for agroforestry.
20. Peter Huxley
ICRAF
P.o. Box 30677
Nairobi
KENYA

A combined case study/systems approach for agroforestry teaching
21. Esther Kariuki
Kenya Agricultural Research
Institute
P.o. Box 74
Kikuyu
KENYA

The need and level of agroforestry education. (Combined paper with J. Maghembe)
22. Joseph C. Madamba
Director
Southeast Asian Regional
Center for Graduate Study
& Research in Agriculture
(SEARCA)
College, Laguna 3720
PHILIPPINES

Building in-country capabilities for the development of efficient agroforestry systems in Southeast Asia.

23. Jumanne Maghembe
Division of Forestry
Faculty of Agriculture
Forestry
& Veterinary Science
University of Dar-es-Salaam
c/o. Sub Post Office
Morogoro
TANZANIA
- The need and level of agro-forestry education. (Combined paper with Esther Kariuki)
24. B.K. Maiyo
Lecturer
Kenya Forestry College
P.o. Box 8
Londiani
KENYA
- The scope of using the existing forestry programme structures for agroforestry education
25. H.J. von Maydell
Institut fuer Weltforstwirtschaft
Leuschnerstrasse 91
D-2050 Hamburg 80
FEDERAL REPUBLIC OF GERMANY
- What will be expected of professional agroforesters?
26. G.L. McClymont
Australia Rural Adjustment Unit
University of New Zealand
Armidale NSW 2351
AUSTRALIA
- An agro-system - ecosystem and farming system framework for professional agro-forestry education
27. J.A. Odera
Deputy Director
Forestry Research Department
Kenya Agricultural Research
Institute
P.o. Box 74
Kikuyu
KENYA
- Agroforestry education for contemporary and future land use development in Kenya
28. David U. Okali
Head, Department of Forest
Resources Management
University of Ibadan
Ibadan
NIGERIA
- Elements of agroforestry in existing forestry education programmes in Nigeria
29. D.S.O. Ogiru
Department of Crop Science
Makerere University
P.o. Box 7062
Kampala
UGANDA
- What will be expected of professional agroforesters?
30. Frederick Owino
Forestry Department
University of Nairobi
P.o. Box 30197
Nairobi
KENYA
- Experience in teaching agroforestry at university level in Kenya

31. Lucrecio L. Febugao
Director, Centre for Forestry
Education and Development for
Asia and the Pacific
College of Forestry
College, Laguna
P.o. Box 430
PHILIPPINES
Logic of agroforestry curri-
culum development - the case
of UPLB.
32. Mandivamba Ndlovu
Department of Land Management
University of Zimbabwe
P.o. Box 167
Harare
ZIMBABWE
Agroforestry in land management
education programmes.
33. Michael Stocking
Overseas Development Group
University of East Anglia
Norwich, NR4 7TJ
ENGLAND
Agroforestry education for
rural development.
34. Abd-El-Aziz O. Tantawy
Secretary General of the
Association of the Faculties
of Agriculture in Africa
C/o Institute Agronomique et
Vet.
P.o. Box 704 AGDAL
Rabat
MOROCCO
Staff specialization and teach-
ing courses in faculties of
agriculture in Africa
35. Khubchand Tejwani
25/31 Old Rajindra Nagar
New Delhi 110006
INDIA
(Unable to attend)
Personpower in agroforestry
36. Kimani Waiithaka
Department of Crop Science
Faculty of Agriculture
University of Nairobi
P.o. Box 30197
Nairobi
KENYA
Abstract - the role of horti-
culture

<u>Contributors of Reviews of Source Materials</u>	<u>Titles</u>
37. M.G. Cannell Institute of Terrestrial Ecology Bush Estate Penicuik Midlothian EH26 0QB Scotland ENGLAND	Review of key literature materials relevant to plant aspects of agroforestry.
38. Till Darnhofer ICRAF P.o. Box 30677 Nairobi KENYA	Agroforestry and meteorology in agroforestry: A review of source materials and literature.
39. Dirk Hoekstra ICRAF P.o. Box 30677 Nairobi KENYA	Review of economic literature relevant for agroforestry
40. Melinda Khan Environment Liaison Centre P.o. Box 72461 Nairobi KENYA (Unable to attend)	NGO's and agroforestry.
41. Richard Labelle ICRAF P.o. Box 30677 Nairobi KENYA	A qualitative overview of sources of agroforestry information.
42. P.K.R Mair ICRAF P.o. Box 30677 Nairobi KENYA	Soils and soils management in agroforestry
43. John Raintree ICRAF P.o. Box 30677 Nairobi KENYA	Readings for a socially relevant agroforestry.
44. Filemon Torres ICRAF P.o. Box 30677 Nairobi KENYA	Role of woody perennials in animal agroforestry.

45. Cor Veer
Department of Forest Management
Wageningen Agricultural University
Gen. Postkade 64
P.o. Box 342
6700 AH Wageningen
THE NETHERLANDS

Management of agroforestry:
A selective annotated bibliography for educational purposes.

Registered Observers

46. S.O. Akech
Sec. Schools Equipment Scheme
Ministry of Higher Education
P.o. Box 30040
Nairobi
KENYA
47. Lincoln Bailey
Ministry of Energy
P.o. Box 30532
Nairobi
KENYA
48. Michel Baumer
Consultant
146 Combe Caude
34100 Montpellier
FRANCE
49. Arnim Bonnemann
Colégio Florestal
Caixa Postal 30
84.500 - Irati PR
BRAZIL
50. Alexander Buchele
German Forestry Team
c/o. GAF
P.o. Box 41607
Nairobi
KENYA
51. John Colecia
Division of Ecological Sciences
UNESCO
7 Place de Fontenoy
Paris
FRANCE
52. Ebby Obegala
Kenya Agricultural Research
Institute
Forestry Department
P.o. Box 30148
Nairobi
KENYA

53. Livingston Dangana
Ecological Sciences UNESCO, ROSTA
P.o. Box 30592
Nairobi
KENYA
54. Abdel Wahab El Moursi
Agricultural Education Officer, ESHE
FAO
Via delle Terme di Caracalla
00100 Rome
ITALY
55. Julian Evans
Forestry Commission Research Station
Alice Holt Lodge
Surrey
ENGLAND
56. Philippe Grandidier
French Documentation Centre
P.o. Box 41784
Nairobi
KENYA
57. Haluk A. Hilmi
Chief, Forestry Education & Institutions
Branch
Forest Resources Division
FAO
Via delle Terme di Caracalla
00100 Rome
ITALY
58. Amanda B. Jones (with Nairobi University, NAS Project)
Department of Agriculture & Forestry
Oxford University
ENGLAND
59. David B. Jones
Agricultural Programme Advisor
The Ford Foundation for Eastern
& Southern Africa
P.o. Box 41081
Nairobi
KENYA
60. David Joslyn
S&T/FNR
Chief, Division of Forestry
Agency for International Development
Washington D.C. 20523
U.S.A.
61. Humphrey K. Kariuki
Forestry Department
Egerton College
P.o. Private Bag
Njoro
KENYA

62. C.N. Karue
University of Nairobi
P.o. Box 30197
Nairobi
KENYA
63. Roger Kirkby
IDRC (Crops & Cropping Systems)
P.o. Box 62084
Nairobi
KENYA
64. Bernard Leduc
Institute de Recherche d' Agronomic
Tropicale (IRAT)
IDESSA/DCV
B.P. 635
Boukè
IVORY COAST
65. Luther Lulandala
Division of Forestry
University of Dar-es-Salaam
c/o. Sub Post Office
Morogoro
TANZANIA
66. Gedeon Munyarugerero
Institute des Sciences
Agronomiques du Rwanda
P.B. 617 Butare
REPUBLIQUE RWANDAISE
67. Richard C. Ntiru
ICRAF
P.o. Box 30677
Nairobi
KENYA
68. R.S. Odingo
Geography Department
University of Nairobi
P.o. Box 30197
Nairobi
KENYA
69. Patrick J. Robinson (seconded to ICRAF)
Unit of Tropical Silviculture
Commonwealth Forestry Institute
South Parks Road
Oxford OX1 3RB
UNITED KINGDOM
70. Laurence Roche
Head, Department of Forestry
& Wood Science
University College of North Wales
Bangor, Gwynedd LL57 2NW, UNITED KINGDOM

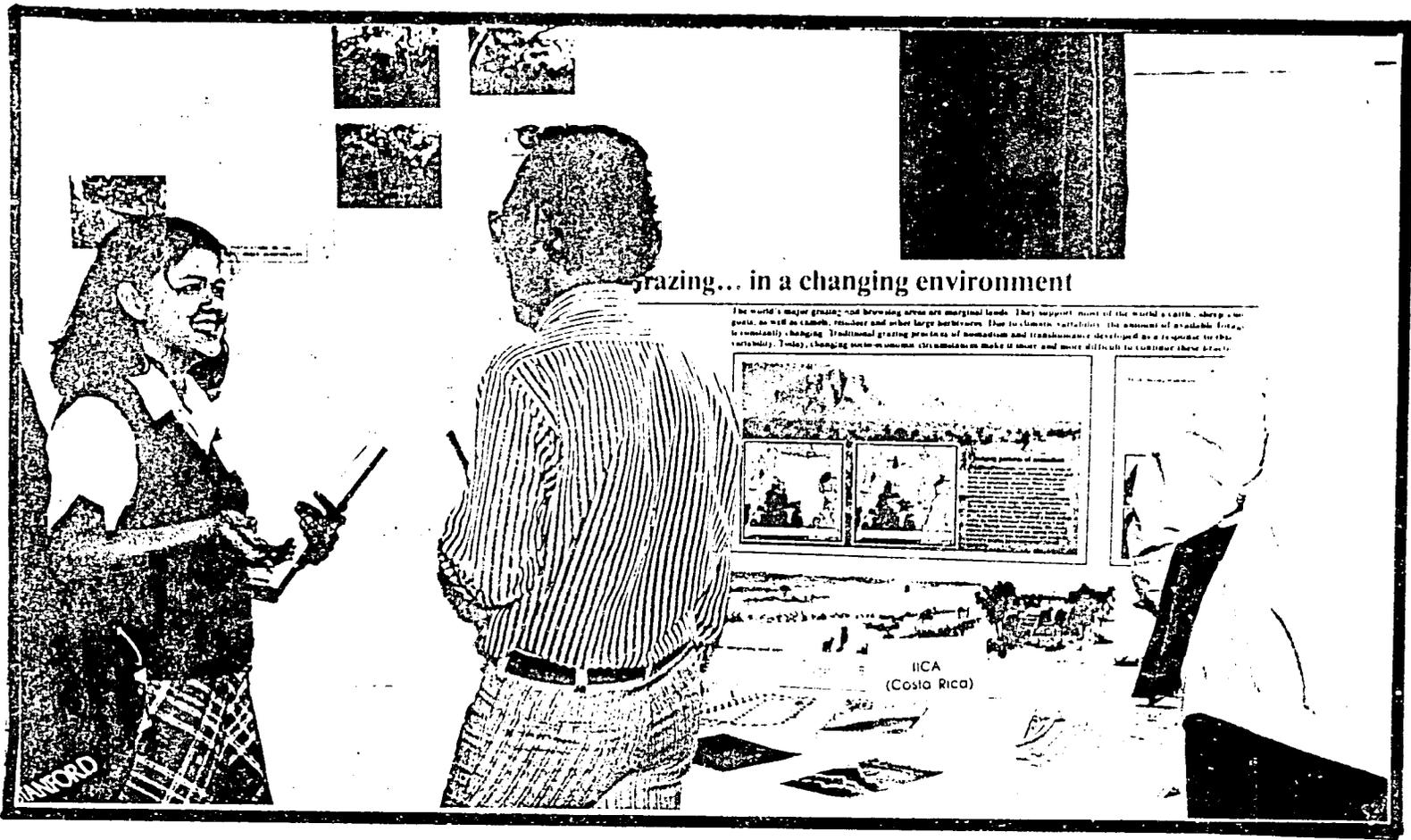
71. Andreas Speich
Rural Forestry Adviser
(Forest Department)
P.o. Box 30513
Nairobi
KENYA

5.

THE WORKSHOP IN PICTURES

- PHOTO 1 - Working groups' Chairmen reporting during plenary session.
- PHOTOS 2 - Participants interacting during the Display
- PHOTO 3 - A view of the Display





grazing... in a changing environment

The world's major grazing and browsing areas are marginal lands. They support most of the world's cattle, sheep and goats, as well as camels, reindeer and other large herbivores. Due to climate variability, the amount of available forage is constantly changing. Traditional grazing practices of nomadism and transhumance developed as a response to this variability. Today, changing socio-economic circumstances make it more and more difficult to continue these practices.

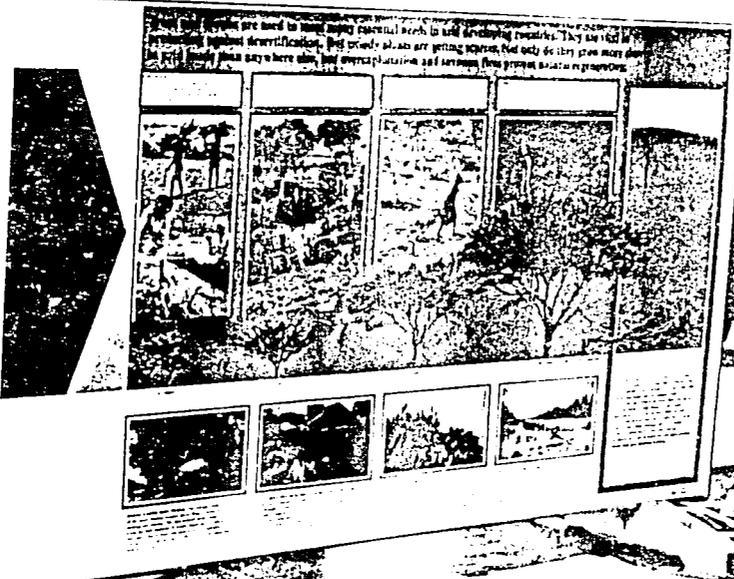
A display panel featuring a large landscape photograph of a rural field with a fence. Below the photo are two smaller inset photographs showing people in a field. To the right of the inset photos is a column of text.

IICA
(Costa Rica)

INFORM

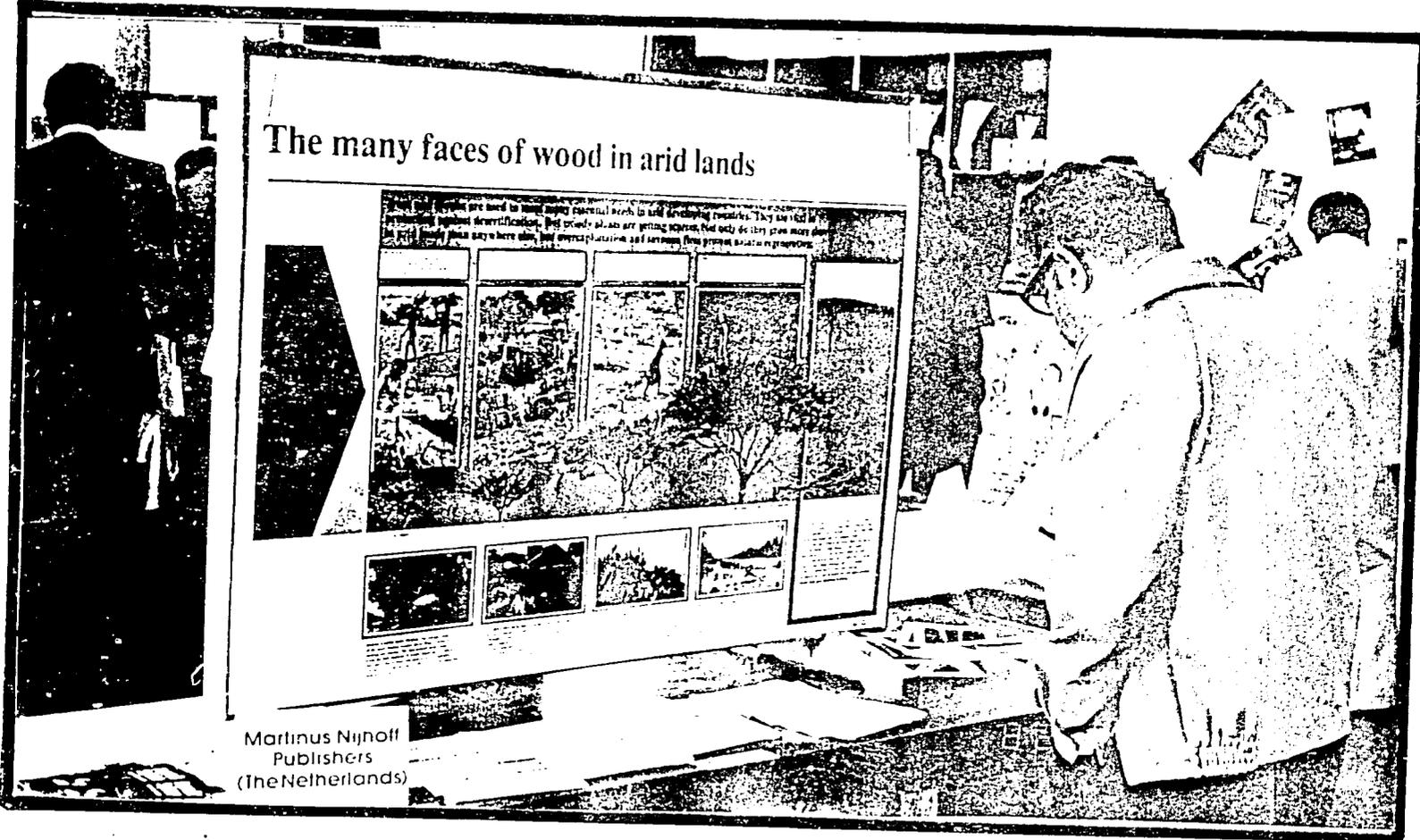
The many faces of wood in arid lands

Wood is used to build, support, shelter and develop countries. They are used in a traditional manner, but people are getting more and more aware of the fact that wood is not only a source of energy, but also a source of raw materials. Wood is used in many ways here also, but over-exploitation and destruction have become a serious problem.



The display board features a grid of approximately 12 photographs. The top row shows large-scale construction and industrial uses of wood. The middle row features several smaller images, including a person working with wood and various types of trees. The bottom row contains four small, square photographs showing different wood products and their applications in arid environments.

Martinus Nijhoff
Publishers
(The Netherlands)



6.

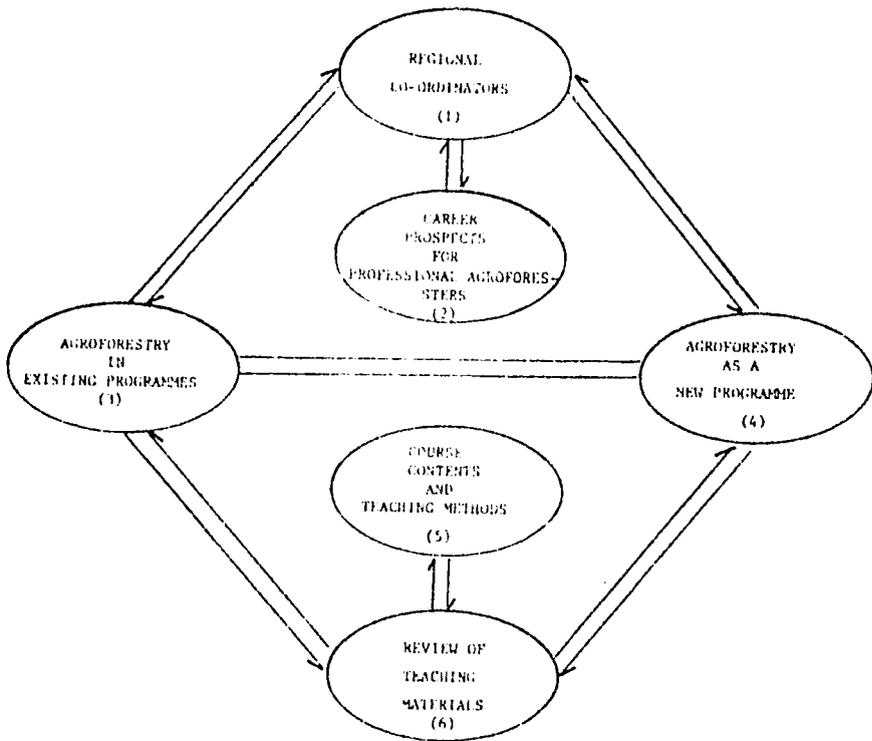
WORKING GROUPS' RECOMMENDATIONS

Early on in the organization of the Workshop it was decided that six working groups were to be convened to discuss topics related to the main objectives of the meeting (see Figure 1). Chairmen were selected and a one day preliminary meeting was held prior to the official opening of the Workshop to discuss the general scope and outcome of each working group.

All participants were invited, during the course of the Workshop to submit written comments for each of these working groups to consider, through an adapted version of the Nominal Group Technique. Working Groups met individually and/or joined other groups temporarily when considered necessary. Two general meetings (plenaries) were held to report on the advancement of the working groups and formulate recommendations, and a final plenary session took place on the last day where Chairmen presented a summary of resource documents and recommendations.

There is a good deal to be reported regarding the working groups' discussions that is to be extended in the proceedings of the Workshop. At this stage we present merely a summary of the key issues addressed by each working group and the main recommendations together with a brief note on the resource documents produced or identified for future preparation.

FIGURE 1. INTER-RELATIONSHIPS OF WORKING GROUPS



GROUP 1: REGIONAL CO-ORDINATORS

CHAIRPERSON: El-Hadji Sene

KEY QUESTIONS ADDRESSED:

- . What are the common problems and constraints of agroforestry education?
- . Are there any particular regional needs?
- . What is the present overall educational situation -actual and planned?
How can we best summarize the present situation?
- . How do we keep up-to-date with what is happening in agroforestry education?
- . What are the problems of development and/or conservation of agroforestry systems that we should educate for?
- . What are the opportunities for co-operation between countries with regards to educational institutions?

MAIN RECOMMENDATIONS

1. In assessing the overall situation in agroforestry one realizes the great urgency to inventory the traditional agroforestry systems. It is recommended that ICRAF go ahead with and expedite the Agroforestry Systems Inventory already under planning so as to provide relevant teaching materials about existing practical situations. (It is also recommended that efforts should be made to preserve those interesting agroforestry practices and germplasm that might be disappearing).
2. To best keep up with new developments in agroforestry education, it is recommended that:
 - a) immediate, separate and wide distribution of the regional coordinators' reports be made to obtain corrections and/or additional information for an update of these documents;
 - b) there is a thorough circulation of this Workshop's proceedings along with regional coordinators' submissions and position papers;
 - c) a regular revision of the findings in regional coordinators' submissions should be made either through regional coordinators' or any other person, or arrangements ICRAF thinks suitable;

- d) ICRAF should arrange to have focal points in each country, either on an institutional basis or through individuals, to collect and disseminate information on agroforestry education;
- e) international and regional institutions such as ICRAF, CATIE, IICA, FAO, UNESCO...etc, should all cooperate in gathering, exchanging and disseminating information on agroforestry education;
- f) information exchanges be encouraged and sustained between countries engaged in agroforestry in homologous ecological regions in different continents;
- g) publication, and circulation of journals in agroforestry be encouraged.

4. For agroforestry awareness, substantiation and buildup, it is recommended that short courses, and seminars be encouraged and multiplied. They should be well prepared as far as resource documents, demonstrations, field practice, and visual aids are concerned.

5. To develop cooperation in agroforestry education the following guidelines are recommended:

- a) cooperation between developing countries (south-south exchanges), and involvement of regional organizations;
- b) cooperation between teaching and research institutions in developed and developing countries can be through whatever arrangements are suitable (e.g. twinning) in areas such as: information exchange; library exchange; exchange of lectures; research workers; student and field workers; and, exchange of germplasm for field work;
- c) support from funding institutions is needed to help implement this, and cooperation should be actively sought and encouraged.

RESOURCE DOCUMENTS

This group presented a list of institutions teaching elements of agroforestry, or likely to do so in the near future.

GROUP 2: CAREER PROSPECTS FOR PROFESSIONAL AGROFORESTERS

CHAIRPERSON: Jeffrey Odera

KEY QUESTIONS ADDRESSED:

- . What will be expected of professional agroforesters?
- . What are the present/future job prospects on qualifying?
- . What sort of numbers are involved (do we need manpower surveys)?
- . What ultimate career prospects are there?
- . What are the "re-training" needs?
- . What kind of education programmes should be given priority?
- . How do we influence educational policy?
- . What are the materials infrastructural problems?

MAIN RECOMMENDATIONS

1. An agroforester could be:
 - a) an extension officer, land resource manager and rural development officer;
 - b) a researcher or a teacher;
 - c) a coordinator of rural development programmes.
2. Agroforestry research, education and training at all levels should aim at increasing the overall human-ecological carrying capacity through developing more sustainable land use systems.
3. Rather than have a manpower survey we should have surveys of the *level of institutionalization* of agroforestry. This will identify those institutions most adapted to accommodating persons trained in agroforestry. Up-dating of information can be achieved either through the activities of ILFRO subdivision 1.7.7 (the working party on agroforestry) through ICRAF, and/or other regional or international organizations.
4. The agroforester needs to work within national professional career prospects as any other professional.

5. High priority should be given to re-orient and/or update educated specialists through in-service training programmes.
6. Another high priority would be to organize an international training course for potential leaders in agroforestry development education.
7. Agroforestry education should concentrate on one year masters' degree programmes. This could be followed by research projects. Agroforestry could, however, be among the basic subjects to be offered in lectures common to all relevant rural development sciences at an early stage of University education or as a course elective.

RESOURCE DOCUMENT

The bases were established for a career advisory booklet.

GROUP 3: AGROFORESTRY IN EXISTING PROGRAMMES

CHAIRPERSON: Eduardo Escalante

KEY QUESTIONS ADDRESSED:

- . How is agroforestry being taught at present and in what kind of programmes?
- . How best can we relate agroforestry to other disciplines/programmes or vice-versa?
- . Where is it easiest to start?
- . Is there a danger of "overlap" - and how do we deal with this?
- . What are the areas of emphasis and/or selection?

MAIN RECOMMENDATIONS

1. That appropriate existing programmes be strengthened by emphasizing agroforestry principles and examples whenever possible even at the undergraduate level.
2. That in developing specific agroforestry programmes priority be given to short programmes for re-training existing personnel, and to post-graduate programmes.
3. That International Institutions and Donor Countries be urged to intensify their financial and institutional support to centres wishing to develop or strengthen agroforestry education.

RESOURCE DOCUMENT

The group produced a table showing the degree of involvement of agroforestry in education programmes in forestry, agriculture and other land use disciplines by region (N. America, S. America, C. America, Australia/S. Pacific, Western Europe, Africa (francophone), Africa (anglophone), N. Africa, Indian Sub-Continent and South East Asia).

GROUP 4: AGROFORESTRY AS A NEW PROGRAMME

CHAIRPERSON: G.L. McClymont

KEY QUESTIONS ADDRESSED:

- . Should we teach agroforestry as a new (independent) programme?
- . What kind of approaches should we adopt to the teaching of agroforestry?
- . What are its limits? and are there "displacement" problems vis-a-vis other programmes?
- . What resource and infrastructural problems are there for various teaching institutions in setting up a new programme?
- . Which should be the areas of emphasis and/or selection?

MAIN RECOMMENDATIONS

1. Special programmes in agroforestry should be established only where other approaches to providing the educational programmes needed to supply teachers, research and extension workers related to agroforestry farming systems have been unsuccessful, or are contra-indicated.
2. Priority in developing an understanding of agroforestry farming systems should be sought through:
 - a) post-graduate short courses, and eventually masters' programmes;
 - b) in-service courses for extension workers;
 - c) an international training course for potential leaders in agroforestry education, research and extension *in relation to AF farming systems* .
3. Countries should consider establishment of *ad hoc* committees to examine the overall status of farming system education and training, research and extension (including that required for developing AF systems) and, if indicated, make recommendations for its development or improvement.

GROUP 5: COURSE CONTENTS AND TEACHING METHODS

CHAIRPERSON: Jeffrey burley

KEY QUESTIONS ADDRESSED:

- . How do we summarize existing courses in AF and how do we keep up-to-date with this information?
- . How can we list the kinds of courses best suited for (a) existing programmes and (b) possible new programmes?
- . What can be done to help prepare course outlines and teaching materials?
- . What conclusions do we have about the most appropriate teaching materials in different conditions?

MAIN RECOMMENDATIONS

1. Recognising that the needs for agroforestry teaching vary with region, country, institution and the individual student's background, it is recommended that the planners of new courses and programs should first assess the need for the proposed course and, *if the course is justified*, then consult the checklist of course contents prepared at this Workshop. The relevance of specific contents to actual needs should be determined in consultation with Government and private employers. The contents of courses may be modified by feedback after the first generations of students have graduated and completed some years of employment.
2. The organizers of agroforestry courses and programs should send full details of their course structures for storage at ICRAF and dissemination to other educational institutions on request. If possible these should be evaluated later in relation to inputs and type of student output.
3. Since most agroforestry practice, research and development occur currently in developing countries it is recommended that Governments and institutions seek to operate TCDC funds in order to facilitate exchanges of staff between developing countries for teaching, for participation in seminars and courses, and for study tours.

RESOURCE DOCUMENT

Listed outlines of subjects to be covered in an hypothetical "agroforestry" course.

GROUP 6: REVIEW OF TEACHING MATERIALS

CHAIRPERSON: Melvin Cannell

KEY QUESTIONS ADDRESSED:

- . What materials are available for teaching agroforestry and what recommendations can be made about them?
- . What additional materials should be prepared?

MAIN RECOMMENDATIONS

1. The task of integration and selection of the principles relevant to agroforestry is very great in certain fields, such as socio-economics and crop eco-physiology. It is, therefore, recommended that specialists who are familiar with agroforestry are assigned to prepare digests of literature in their fields for use in agroforestry teaching.
2. Visual aid slide packages should be prepared together with an explanatory booklet, to illustrate the concepts, complexity and diversity of agroforestry land use systems existing around the world.
3. The review "The role of woody perennials in animal agroforestry" is more suitable for publication in an international journal, perhaps in a condensed form. Other reviews of teaching materials should be, after suitable editing, be supplemented by references obtained during the workshop, and provided with an introduction explaining the difference in approach of the reviewers. This commendum which forms a useful annotated list of references for lecturers and teachers - should then be bound, advertised by ICRAF, and distributed in mimeographed form.

RESOURCE DOCUMENTS

The following reviews were discussed and proposals for up-dating and expanding them were made.

<u>Title</u>	<u>Author</u>
1. Role of woody perennials in animal agroforestry	Filemón Torres ICRAF
2. Soils and soil management in agroforestry	P.K. Nair ICRAF
3. Readings for a socially relevant agroforestry	John Raintree ICRAF
4. A qualitative overview of sources of agroforestry information	Richard Labelle ICRAF
5. Review of economic literature relevant to agroforestry	Dirk Hoekstra ICRAF
6. Agricultural meteorology in agroforestry: A review of source materials and literature	Till Darnhofer ICRAF
7. Management of agroforestry: A selective annotated bibliography for educational purposes	Cor P. Veer WAGENINGEN Agricultural University. The Netherlands
8. Review of key literature materials relevant to plant aspects of agroforestry	Melvin G.R. Cannell Institute of Terrestrial Ecology, Penicuik, U.K.

SUMMARY OF THE WORKSHOP EVALUATION

A brief evaluation form was circulated among participants on the last day of the Workshop with the intention to gather comments about the outcomes and general organization of the event and suggestions for future similar activities.

In general, participants had a very positive reaction towards the Workshop structure and operational support services. Objectives were considered to be clearly defined at the beginning and reasonably accomplished at the end of the five days of work. The accommodation, meals and physical facilities were considered appropriate.

Special praise was given to the informal atmosphere and very friendly relationship among participants, even when controversial ideas were discussed; the display of books, posters, etc.; the very diverse group of people gathered together; and, the working group discussions.

The amount of resource materials available, particularly the position papers, was considered in excess, taking into account the duration of the Workshop.

In the overall, the Workshop was considered a very stimulating experience and several people gathered ICRAF/DSE should organize more activities like this one.



A P P E N D I X 1

QUESTIONNAIRE ON PROFESSIONAL
EDUCATION IN AGROFORESTRY

(Please give answers on extra sheets as necessary)

NAME AND ADDRESS OF PERSON RETURNING QUESTIONNAIRE (INCLUDING ORGANISATION AND POSITION).

BACKGROUND QUESTIONS - Please answer from your general knowledge of the situation if you are unable to give specific data, and elaborate as much as possible.

1. To what extent are agroforestry land use systems being practiced in this country? Indicate what kinds of systems. Are they successful?
2. Are there opportunities to introduce new systems of agroforestry? If so, of what kind?

QUESTIONS ON THE NEEDS FOR PROFESSIONALLY EDUCATED AGROFORESTRY PERSONNEL - Please answer as fully as possible

3. What types of professional personnel educated in agroforestry may be required in your country in the next five years?

Land resource planners
Land resource management experts
Extension personnel
Research personnel
Training/teaching staff
Others (designate)

(Also add estimates of numbers (and level of speculation about these) for the next five years for the above categories if at all possible.

QUESTIONS ON THE PRESENT LEVEL OF AGROFORESTRY EDUCATION - (Please provide any documentation providing further information, if this is available)

4. Indicate, with complete addresses, the institutes in your country (including your own) which are now teaching professional personnel in agroforestry (certificate, diploma, degree or higher degree levels). If such education is actively being planned at this time please indicate this separately.

Briefly describe for each Institute/Faculty

- a) Type of programme or course
- b) Duration
- c) Professional qualification obtained
- d) Approximate output (by year)
- e) Approximate level of government or other financial support for agroforestry education and the staff and material inputs allocated to these courses/programmes.

QUESTIONS ON THE POSSIBLE DEVELOPMENTS OF AGROFORESTRY EDUCATION

5. What existing activities (or plans) may effectively increase the scope of existing professional teaching of agroforestry?

For example:

- a) Are there existing courses in land use/land management subjects, ecology, biology, etc. which could easily include agroforestry.
- b) Are there facilities for establishing short-term courses or seminars on agroforestry, if this is considered necessary.

CONCLUSIONS

6. What other pertinent information can you contribute regarding the needs for professional education in agroforestry in your country over the next decade.

7. Please add any other comments or views if you wish.

A P P E N D I X 2

LIST OF PUBLISHERS

(* Displayed material during the Workshop)

* AB Academic Publishers

P.O. BOX 97
Berkhamsted
Herts HP4 2BX
ENGLAND

Academic Press
111 Fifth Avenue
New York N.Y. 10003
U.S.A.

American Society of Agronomy
672 South Segoe Road
Madison
Wisconsin 53711
U.S.A.

APIMODIA
Corso Vittorio Emanuele 101
00186 Roma
ITALY

Butterworth Scientific Ltd.
P.O. BOX 63
Westbury House
Bury Street, Guildford
Surrey GU2 5BH
ENGLAND

Chatto and Windus Ltd.
40 William IV Street
London W.C.2
UNITED KINGDOM

Cambridge University Press
The Pitt Building
Trumpington Street
Cambridge CB2 1RP
UNITED KINGDOM

* CIAT

Apartado 67
Cali
COLOMBIA

Commonwealth Agricultural Bureaux
Farnham House
Farnham Royal
Slough 2L2 3BN
UNITED KINGDOM

* Commonwealth Forestry Institute
South Parks Road
Oxford
UNITED KINGDOM

CSIRO Editorial and Publications Service
c/o 9 Queens Road
Melbourne vic. 3004
AUSTRALIA

CSIRO
314 Albert Street
East Melbourne
Victoria 3002
AUSTRALIA

* CATIE
Turrialba
COSTA RICA

Department of Horticulture
University of Hawaii
3170 Maile Way
Honolulu
Hawaii 96822
U.S.A.

Department of Primary Industries
Mineral House
George Street
Brisbane
Queensland 4000
AUSTRALIA

Edward Arnold
41 Bedford Square
London W.C.1 3DQ
UNITED KINGDOM

Elsevier Seguoia S.A.
P.O. BOX 851
1001 Lausanne 1
SWITZERLAND

Elsevier Scientific Publishing Company
P.O. BOX 330
1000 AH Amsterdam
THE NETHERLANDS

ENDA
B.P. 3370
Dakar
SENEGAL

* FAO
Via delle Terme di Caracalla
00100 Rome
ITALY

GERDAT
42, rue Scheffer
75016 Paris
FRANCE

H.K. Lewis and Co.Ltd.,
P.O. BOX 66,
136 Gower Street
London, W.C.1E 6BB
UNITED KINGDOM

ICRISAT
Documentation Services
Patancheru
P.O. Andhra Pradesh 502324
INDIA

* IDRC
Publications
P.O. BOX 8500
Ottawa K1G 3H9
CANADA

* IICA
Direccion General
Sede Central
Apartado 10281
San Jose
COSTA RICA

* ILCA
Publications Section
P.O. BOX 5689
Addis Ababa
ETHIOPIA

India Forester
P.O. New Forest
Dehra Dun
INDIA

* International Board for
Plant Genetic Resources
FAO
Rome
ITALY

* International Tree Crops Institute USA Inc.
P.O. BOX 888
Winters
California 95694
U.S.A.

Iowa State University Press
Ames
Iowa 50010
U.S.A.

- * IRRI
Documentation Services
Los Baños
P.O. BOX 933
Manilla
PHILIPPINES

John Wiley and Sons Ltd.
Barfins Lane
Chichester, West Sussex PO19 1UD
England
UNITED KINGDOM
- * Lange and Springe
Wissenschaftliche Buchhandlung
Heidelberger Platz 3
D-1000 Berlin 33
WEST GERMANY
- * Martinus Nijhoff Publishers
P.O. BOX 566
2501 CN The Hague
THE NETHERLANDS
- * Pergamon Press
Headington Hill Hall
Oxford OX3 0UW
ENGLAND
- * Pudoc
P.O. BOX 4
6700 AA Wageningen
THE NETHERLANDS

Renale Janssen
Fachliteraturvertrieb
Alsterwiesen 42
D2359 Henstedt-Ulzburg 3
WEST GERMANY

Royal Botanical Gardens
Kew, Richmond
Surrey
ENGLAND
- * Sahel Documentation Center
Michigan State University Libraries
East Lansing
Michigan 48824
U.S.A.

Society of American Foresters
5400 Grosvenor Lane
Bethesda
Maryland 20014
U.S.A.

* The University of Arizona
Office of Arid Lands Studies
845 North Park Avenue
Tucson, Arizona 85719
U.S.A.

Tropical Grassland Society of Australia
Cunningham Laboratory
C.S.I.R.O.
Gr. Carmody Road and Chancellors' Place
St. Lucia, Brisbane
Queensland
AUSTRALIA 4067

* UNESCO
7, Place de Fontenoy
75700 Paris
FRANCE

* UN University
Toho Seimei Building
T5-1 Shibuya-ku
Tokyo 150
JAPAN

Westview Press
5500 Central Avenue
Boulder
Colorado 80301
U.S.A.

Worldwatch Institute
1776 Massachusetts Ave.N.W.
Washington, D.C. 20036
U.S.A.