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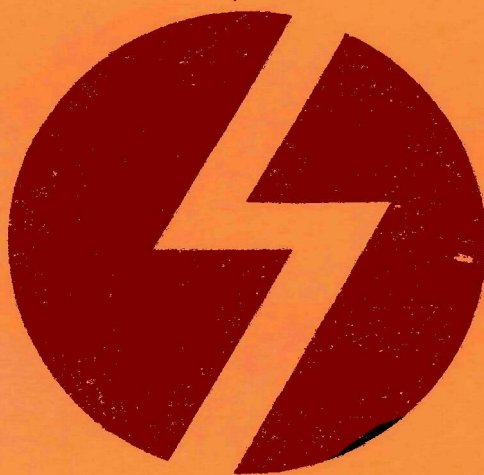
Washington DC 20460



Issues

in

Tropical Deforestation



USIERC

This bibliography was prepared by the staff of the U. N. Environment Program's International Referral System to test several capabilities.

- (1) The effectiveness of the referral system for supporting policy making.
- (2) The ability of the U. S. Focal Point to coordinate information gathering activities among several federal agencies toward a specific end.
- (3) The usefulness of such a document to participants in a conference.

We acknowledge the generous cooperation given by Mr. Wallace Olsen, Deputy Director for Library Services of the National Agricultural Library at Beltsville, Maryland, who provided the references cited in Section III.

We solicit comments on this effort and thank Bill Long for this opportunity.



Carol G. Alexander
Director
U. S. International Environmental Referral Center

SECTION 1: CITATIONS FROM UNEP/IRS FILES

AFRICAN FORESTRY COMMISSION

Contact: African Forestry Commission
FAO Regional Office
PO Box 1628
Accra, Ghana

AGRICULTURE DEPARTMENT-FOREST SERVICE

Contact: Chief
Forest Service
U. S. Department of Agriculture
P. O. Box 2417
Washington, D. C. 20013

Telephone No.: (202) 447-6661

Description of Source: Information available in nearly all aspects
of forestry and related fields.

ASIA-PACIFIC FORESTRY COMMISSION

Contact: Asia-Pacific Forestry Commission
Maliwan Mansion
Phra Atit Road
Bangkok, Thailand

CANADIAN FORESTRY SERVICE

Contact: Stewart J V
Canadian Forestry Service
Place Vincent Massey
Hull Que
Canada

Telephone No.: (819) 997-1439

Description of Source: Economics, Forestry, Policy

C. S. I. R. O

Contact: Dr. M. F. C. Day
Division of Forest Research, C.S.I.R.O.
Post Office Box 4008
Canberra A.C.T. 2600
Australia

Telephone No.: (062) 818211

Description of Source: Forest ecosystems in relation to timber production and all other uses of forests, ecology, management and harvesting of forests, forest pests, tree physiology, health nutrition, hydrology and multiple, use of forests.

CZECHOSLOVAK RESEARCH AND DEVELOPMENT CENTRE FOR ENVIRONMENTAL POLLUTION CONTROL

Contact: Czechoslovak Research and Development
Centre for Environmental Pollution
Control
Tr. Laca Novomeskeho-2
Bratislava 816 43
Czechoslovakia

Telephone No.: 36291 Telex 92229

Description of Source: Crop production animal husbandry, agricultural economics, agricultural engineering, agricultural machinery, veterinary medicine, forestry, nature conservation.

DEPARTMENT OF FORESTRY

Contact: Forest Land Use Planner (D W Van Der Zel)
Forest Land Use Planning Section, Department of Forestry
Private Bag X93
Pretoria Transvaal 0001
South Africa

Telephone No.: 012 482911 Telex: 3717

DEPARTMENT OF FORESTRY (CONT'D)

Description of Source:	Acquisition, Planning and management of government forest land for protection of natural vegetation; productions of forest products, training of personnel, carrying out of research, provision of assistance to public and private growers; and regulation of assistance to public and private growers; and regulation of national forestry enterprise.
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FEDERAL PAPER BOARD COMPANY, INC.

Contact:	Vice President - Manufacturing Federal Paper Board Company, Inc. Riegelwood Operations Riegelwood, North Carolina 28456 United States
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Telephone No.:	(919) 655-2211
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Description of Source:	Manufacturer of pulp & paperboard, extensive forestry operations. High degree of water and air pollution control: freshwater, intake and treatment, monitoring of wastewater, freshwater receiving stream, air emissions control and monitoring.
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FOREST DEPARTMENT

Contact:	The Conservator of Forests Forest Department P. O. Box 509 Colombo 2 Sri Lanka
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Telephone No.:	32251
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Description of Source:	Manages and protects all natural forests of Sri Lanka. Demarcates and preserves man and the biosphere plot. Reforestation of degraded forests at 01% of total land area per chairs state timber corporation which is responsible for harvesting and sale of timber.
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FOREST DEPARTMENT

Contact: Conservator of Forest, Research and
Development Circle
Forest Department, Uttar Pradesh
17, Rana Pratap Marg
Lucknow Uttar Pradesh 226001
India

Description of Source: Planning management development of
forest-resource, resource inventories,
exploitation, regeneration, affores-
tation, soil conservation, wild life
management, recreation and amenity pro-
vision in forest areas control forest
fire and diseases forest research.

FORESTRY COMMISSION OF N S W

Contact: The Secretary
Forestry Commission of N S W
G. P. O. Box 2667
Sydney 2001
Australia

Telephone No.: (02) 20236 Telex: AA21657

Description of Source: Forest Management and advice on
trees and forests

INSTYTUT KSTALTOWANIA SRODOWISKA

Contact: Director
Instytut Kształtowania Środowiska
Ul. Krzwickiego 9
02-078 Warszawa
Poland

Telephone No.: 216481 Telex: 813493

Description of Source: The Forest Research Institute is acting
within frame-work of state forest or-
ganization, having national-wide scope;
it carries out research includes all

INSTYTUT KSTALTOWANIA SRODOWISKA CONT'D

fields of forestry and efficient
production of timber raw material.
In particular: forest management,
silviculture, biological fundaments,
silviculture.

INTERNATIONAL UNION OF FORESTRY RESEARCH ORGANIZATIONS

Contact: International Union of Forestry
Research Organizations
Forstliche Forschungsanstalt
Amalienstrasse 52/11
Munich 13 Germany

LATIN AMERICAN FORESTRY COMMISSION

Contact: Latin American Forestry Commission
Providencia 871
Casilla Postal 10095
Santiago, Chile

NEAR EAST FORESTRY COMMISSION

Contact: Near East Forestry Commission
UN-FAO
PO Box 2223
Cairo U.A.R.

NORTH AMERICAN FORESTRY COMMISSION

Contact: North American Forestry Commission
UN-FAO
Hamburgo 63
Mexico 6 D.F. Mexico

PACIFIC FOREST RESEARCH CENTRE

Contact: Massie MRC DR
Pacific Forest Research Centre
506 W. Burnside Road
Victoria B. C. V8Z 1M5
Canada

Description of Source: Effects of Harvesting and Site Preparation Practices on Forest Resources and Values, Soil Erosion, Sedimentation, changing potentials of watershed, wildlife habitat.

ROYAL FOREST DEPARTMENT

Contact: Chief, Forest Control Division
Royal Forest Department
Pahol Yothin Road
Bangkok
Thailand

Telephone No.: 5791151

Description of Source: In charge of regulation enforcement on protection and conservation of forests.

SCIENTIFIC CENTRE FOR PROTECTION OF NATURAL ENVIRONMENT

Contact: Scientific Centre for Protection of
Natural Environment
National Focal Point of IRS
Industrialna, 7
Sofia, Bulgaria

Description of Source: Forest Institute of Bulgarian Academy of Sciences-Makes Fundamental Research In Afforestation, re-afforestation and rational utilization of forest resources; impact of Industria gases on plantations and trees; Recultivation of lands destroyed by industrial and mining operations.

SERVICE DES FORETS

Contact: Service de Forets
1 Ter Avenue De Lowendal
Paris Seine 75700
France

Telephone No.: (1) 555 95 50

Description
of Source:

Description in English not yet available.
Forets Loisirs-Protection de la Forets.

SIERRA CLUB

Contact: Sierra Club
530 Bush Street
San Francisco, California 94108

Telephone No.: (415) 981-8634

SWEDISH COUNCIL OF ENVIRONMENTAL INFORMATION

Contact: Jordsbruksdepartementet
Fack
S-102 20 Stockholm
Sweden

Telephone No.: (08) 763-10-00 Telex: 11461 Loendep S

Description of Source: The National Board of Forestry in Sweden

WESTERN FORESTRY AND CONSERVATION ASSOCIATION

Contact: Forest Counsel
WFCA/1326 American Bank Building
Portland, Oregon 97205
United States

Telephone No.: (503) 226-4562

Description of Source: Promotes sound forest management including protection, harvesting, reforestation, silvicultural practices and forest conservation. Has a collection of forestry publications from industry, public agencies and educational institutions.

WEYERHAEUSER COMPANY

Contact: John S. Larsen--Director
Weyerhaeuser Company
Environmental Affairs Group
Tacoma, Washington 98401
United States

Telephone No.: (206) 924-2345

Description of Source: Manufacturer of pulp & paper products, Expertise in pollution control technology; forestry techniques and high yield management, combustion technology and use of wood wastes as alternate fuel; wildlife management interrelationship with herbicides, pesticides and forest management techniques.

WORLDWATCH INSTITUTE

Contact: Lester R. Brown - President
Worldwatch Institute
Office of the President
1776 Massachusetts Avenue, N. W.
Washington, D. C. 20036

Telephone No.: (202) 452-1999

Description of Source: Seeks to identify emerging global problems and trends and makes analyses available through world-watch papers & books, a wide range of topics is covered from changing roles of women to environmental sources of disease, energy supplies and food and population growth.

SECTION II: CITATIONS FROM COMMONWEALTH
AGRICULTURAL BUREAUX SYSTEM

Afforestation - faster, better, cheaper.

Schmidt-Vogt, H.; Beda, G; Mlinsek, D.; Schiechtl, H. M.

Nathan, J.

Allgemeine Forstzeitung, 1973, 84, 10, 233-257

Languages: De

Reports on an international afforestation symposium in Carinthia, including papers on: Planting-stock requirements (H. Schmidt-Vogt) (experience favours strong medium-sized plants for high-altitude afforestation); Technique of mountain afforestation (G. Beda, 11 ref). (discusses experience, chiefly Swiss, on the making and maintenance of narrow terraces with simple equipment - cf. FA 28, 5055 - and the growth of Norway Spruce and European Larch on them); Natural reforestation and forest extension (D. Mlinsek) (discusses Yugoslavian experience on the natural recolonization of deforested, degraded, burned and wind-damaged areas by pioneer and commercial species including a welcome natural colonication of karst sites in the neighbourhood of plantations by Pinus nigra); Reforestation of extreme sites (road cuttings, erosion channels, burned areas etc.) (H. M. Schiechtl; 8 ref.) (cf. FA 27, 5282, 33, 4621); and Faster, cheaper and yet better? (J. Nathan) (includes a brief description of a new tractor--drawn planting machine, the 'Quickwood', developed by K. F. Rath, Maria Rojach, Carinthia, in which the operator, by pressing a pedal, controls a plant-hole borer and planting arm designed for planting fairly large stock (the latest mode) is said to be capable of planting on slash-covered sites)).

Agricultural productivity in the humid tropics.

Landwirtschaftliche Produktivitat in regenereichen Tropenlandern.

Rehm, S.

Institut fur Trop. und Subtrop. Pflanzenbau, Universitat Gottingen, German Federal Republic.

Publ: Frankfurt a.M., German Federal Republic.

Umschau in Wissenschaft and Technik, 1972, 73, 2, 44-48

Sec Jnl Source: Tropical Abstracts 28, 8, 1844.

Languages: De

Summary Languages: en

9 ref., pl., fig.

The humid tropics have a very high agricultural potential. Of the 46 million sq.km tropics, 26.5 million sq.km are humid

A study of the different types of intervention and their contribution to land use planning in the tropical moist forests in India.

Mathur, R. S.

For. Res. Inst. & Coll., Dehra Dun, India.

Indian Forester, 1976, 102, 10, 639-649

Languages: En Summary Languages: hindi, de, fr
8 ref.

The human activities, including mining and agricultural, that have caused the depletion of forest resources in India are discussed. An estimate is quoted of 3 million ha of forest area lost to different uses between 1951 and 1973. It is suggested that the pressures on remaining forests could be reduced by improved management techniques to increase their productivity and by provision for multiple use in some areas. A land capability classification is presented in which the 4 proposed classes are: protective forests; productive forests; social forests (for fuelwood, fodder etc.); and aesthetic forests (for recreation, amenity and nature conservation).

Trees and changes in the environment in Caracas.

Aristeguieta, L.

Boletín, Sociedad Venezolana de Ciencias Naturales, 1973, 30, 127, 349-386

Languages: Es

IIE

Discusses the main factors that have recently produced great changes in the ecological conditions in the valley of Caracas, Venezuela, viz. deforestation, the elimination or diversion of rivers and streams, hard surfacing of extensive areas of ground, and heavy traffic. The main ornamental trees traditionally planted in the valley are *Swietenia macrophylla*, *Anacardium excelsum*, *Tabebuia rosea*, *Cedrela mexicana*, *Spathodea campanulata* and *Erythrina* spp. These species should henceforward be used only on the best sites, and never as avenue trees. A list is given of 51 other species or genera of trees and shrubs suitable for ornamental planting in avenues, parks, gardens, centre reservations of motorways, concrete containers, etc., and brief notes are given on each species and the places where it can be used.

with over 1,500 mm annual rainfall. Its production capacity/ha. can be considered four times that of land in the temperate zone. However, some 17 million sq.km of the humid tropics have become unproductive grass-savannah, through shifting cultivation and deforestation. Ways and means of halting this unfavourable process, such as regionalization of agriculture, intensification of production in suitable areas, and reclamation of exhausted land, are discussed.

Air temperatures in central Amazonia. II. The effect of near-surface temperatures on land-use in the Tertiary region of Central Amazonia.

Brinkmann, W. L. F.; Ribeiro, M. N. G.

Acta Amazonica, 1971, 1, 3, 27-32

See Also: 121911

Languages: En Summary Languages: pt
5 ref.

Maximum and minimum air temperatures were measured weekly ca. 2 cm above ground level from 15 June 1968 to 27 Jan. 1970 on 10 sites in Manaus. The sites included typical climax rain forest, secondary forest, forest land cleared for agriculture and subsequently abandoned, forest cleared and planted with grass, and land with little or no vegetation. Apart from other harmful effects of forest clearance and burning (the customary practice of this area) the temperature records show that on sandy soils the practice of clearing and burning is entirely unsuitable for land to be reforested, or destined for agriculture of animal husbandry. On latosols, although the effects are less extreme, they are still serious and clearing and burning must be used with great caution.

Bioelement loss on clearing a tropical rain forest.

Salas, G. de las; Folster, H.

Facultad Forestal, Univ. Distrital, Bogota, Colombia.

Turrialba, 1976, 26, 2, 179-186

Languages: En Summary Languages: es
19 ref.

Tabulates and discusses data from a tropical lowland forest site in the Middle Magdalena Valley, Colombia. The forest, of known bioelement store, was turned into unburned and burned fallow, and the resultant changes in soil properties and store of elements were determined. The approximate range

of element losses attributable to clearing, burning and cultivation for one year was found to be 60-140 kg K, 100-240 kg CA and 30-80 kg Mg; such quantities could be restored by rainfall input after about 10-20 years' fallow. The 1300-1400 kg of N that are lost above and below ground is apparently restored by N-fixation rates of 100-150 kg/ha year, rather than from rainfall input.

Causes and modalities of erosion in the lower basin of the Wad El-Hadjel (Central Tunisia).
Causes et modalities de l'erosion dans le bassin versant inferieur de l'Qued-El-Hadjel (Tunisie Centrale).
Bonvallot, J.; Hamza, A.
ORSTOM, 18 Avenue Charles Nicolle, Tunis, Tunisia.
IAHS Publication, 1977, No. 122, 260-268
Languages: Fr Summary Languages: en
6 ref.

The authors present some erosion data for the lower sub-basin of the Wad El-Hadjel. The erosion phenomena are due to excessive agricultural exploitation, intense deforestation to provide charcoal, and overgrazing. Modalities of erosion are analyzed. The authors conclude that anti-erosion measures are essential to avoid rapid silting in the future barrage at Sidi Saad 'dagger'.

Changing patterns of disease in the tropics.
Stanley, N. F.; Alpers, M. P. (Editors). Man-made lakes and human health.
Smith, C. E. G.
London School of Hygiene and Tropical Med., London WC1E 7HT, UK.
Publ: London, UK; Academic Press Inc. (London) Ltd.
1975, 345-362
Languages: En

Factors contributing to the changing patterns of disease in the tropics are reviewed under: growth of towns and cities; transport and population movement; agricultural and engineering developments; changes in customs and habits. Increasing urban populations place a strain on often inadequate medical and sanitary services potentiating an increase in many diseases including helminthiasis, e. g. *Wuchereria bancrofti* has spread with urban growth in Asia and East Africa because its vector, *Culex*

fatigans, breeds in latrines, cesspits and sewage-polluted waters. Transport and population movement have resulted in the introduction of diseases to new countries, tourists acquire exotic infections, and intermediate hosts are carried across frontiers. Deforestation and soil erosion have made onchocerciasis endemic in the Volta basin, and man-made lakes have increased the incidence and distribution of schistosomiasis. The author considers that no major agricultural or engineering development should be permitted or funded without adequate research of potential health hazards and provision of resources to control disease problems that may arise.

A comparative study on chemical characteristics of tropical soils from volcanic material under forest and agriculture. Krebs, J. E.; Tan, K. H.; Golley, F. B. Communications in Soil Science and Plant Analysis. 1974, 5, 6, 579-596
Languages: En
9 ref.

Compares the pH, organic matter, and contents of 9 elements in brown latosols (inceptisols) from young volcanic material under primaeval forest in Costa Rica, with data for similar soils cleared of forest and under continuous cultivation (sugarcane, coffee and pasture) for up to 22 years. Compared with the amounts in forest soils, the Ca and Mg contents were reduced and the acid-extractable Al content increased by cropping with sugar cane; Coffee reduced the organic-matter, N and Al contents, while pasture maintained a soil fertility similar to that under forest. The results indicate that deforestation does not necessarily result in rapid soil degradation, and that the soils in this region can be cultivated for at least 10-20 years without excessive deterioration.

Cyclical changes in the habitat and climate of an East African ecosystem. Western, D.; Praet, C. van Nature, UK, 1973, 241, 5385, 104-106
Languages: En
23 ref.

An analysis is made of changes in the ecosystem of the Maasai Amboseli Game Reserve (Kenya), with special

reference to the extensive loss of *Acacia xanthophloea* woodlands during the last two decades. This is attributed to changes in climatic conditions and soil salinity; damage to trees by elephants and overgrazing by livestock are probably secondary factors.

The destruction of Mangroves.

Canestri, V.; Ruiz, O.

Marine Pollution Bulletin, 1973, 4, 12, 183-185

Sec Jnl Source: Ecological Abstracts 74L/2722.

Languages: En

2 ref.

A very general account of the destruction of areas of Mangrove forest on the Venezuelan coast, caused by increased pressure from recreational activities with no legislative controls.

The development, present state and prospects of the exotic forests in Sao Paulo.

Victor, M. A. M.; Kronka, F. J. do N.; Negreiros, O. C. de
Boletim Tecnico do Instituto Florestal, Sao Paulo, 1972,
No. 1, 32 pp + 11 fig.

Languages: Pt

8 ref.

Briefly reviews the history of forestry in Sao Paulo and gives a more detailed study of the establishment of Eucalypt and Pine plantations from 1963 to 1971, with estimates of the supply of and demand for Pine and Eucalypt timber in the 1970s. Diagrams are given to illustrate the extent of deforestation and afforestation in Sao Paulo from 1963 to 1971, and maps are included showing the areas and extent of the Pine and Eucalypt plantations.

An ecological discussion of the environmental impact of the highway construction program in the Amazon basin.

Goodland, R. J. A.; Irwin, H. S.

Landscape Planning, 1974, 1,2/3, 123-254

Languages: En

15 pp. of ref.

The probable environmental consequences of the building of two N.-S. and three E.-W. motorways across Amazonia is

discussed in relation to the flora, fauna, Amerindians, human disease, deforestation and agriculture. Eight types of forest are described in a chapter on the flora and vegetation but little is known about the species in the forests. A chapter on deforestation and agriculture summarizes the official plans for agricultural colonization along the highways, and discusses the changes that will occur in the naturally self-sustaining forest ecosystem, and the environmental and meteorological effects of deforestation caused by shifting cultivation.

The effect of fallow and continuous cultivation on the chemical and physical properties of an alfisol in western Nigeria.

Juo, A. S. R.; Lal, R.

Internat. Inst. Trop. Agric., PMB 5320, Ibadan, Nigeria.
Plant and Soil, 1977, 47, 3 567-584

Languages: En

14 ref.

Properties of sandy surface soils over clayey subsoils under continuous cropping (since 1972) were compared with those under planted fallows and natural bush regrowth at the IITA experimental farm near Ibadan, Nigeria, over a 3-year period after clearing secondary forest in 1972. The farm is 30 km S of the northern limit of lowland rain forest. The fallow treatments included pigeon pea (*Cajanus cajan*), *Leucaena leucocephala*, Guinea grass (*Panicum maximum*) and natural bush regrowth. The planted fallows were slashed annually (3 times for the grass). Data are presented on the organic matter, N, biomass (highest in bush regrowth), pH, cation exchange capacity exchangeable Ca, Mg, K and Mn in the upper 15 cm of the soil, and on infiltration and moisture release characteristics, crop and fallow yields (except bush) and nutrients returned in residues. In continuous soy bean and unmulched maize plots, soil organic matter and pH declined rapidly; whereas residue-mulched maize plots maintained a soil organic matter level comparable with the fallow treatments. In the cropped plots, favourable physical characteristics in the surface soil were maintained when sufficient plant residue (16 t/ha per yr) was returned, whereas the subsoil structure of the original forest soil deteriorated in all cropping treatments. Guinea grass fallows had a distinct advantage in recycling mineral nutrients and maintaining soil

physical properties and organic matter. It is suggested that soils may be planted with a combination of Guinea grass and pigeon pea fallow for 1-2 years after 3-4 years of arable cultivation.

Effect of vegetation on humification in a ferrallitic soil.

Godefroy, J.; Jacquin, F.
IFAC-B. P. 1740, Abidjan, Ivory Coast.
Cahiers ORSTOM, Pedologie, 1975, 13,3/4, 279-298
Sec Jnl Source: Soils and Fertilizers 39, 6182.
Languages: Fr Summary Languages: en

A comparative study of the development of organic matter in ferrallitic soils under evergreen forest and horticultural plantations showed that the humus balance may be maintained for 3-4 yr after deforestation. Tropical forest conditions are favourable for the breakdown of organic matter, but the large proportion of fine particles in the soil prevents a reduction in the humus content.

The effects of clearing and cropping on the organic reserves and biomass of tropical forest soils.

Ayanaba, A.; Tuckwell, S. B.; Jenkinson, D. S.
International Institute of Tropical Agriculture, Ibadan, Nigeria.
Soil Biology & Biochemistry, 1976, 8, 6 519-525
Languages: En
17 ref.

Twenty Nigerian soil samples, mainly from field experiments at the International Institute of Tropical Agriculture (IITA), were used in a study of the effects of clearing and cropping on the C, N and S reserves of soils under secondary lowland rain forest. Soils that has been cropped for 2 yr usually contained less total C and N than the corresponding forest soils. This decline was less rapid when crop residues (maize) were returned to the soil as a mulch than when they were removed. The soils were incubated in the laboratory either fresh, or after exposure to stress treatments (air-drying or fumigation). The amounts of N mineralised by the fresh untreated soils were small and not clearly related to the

cropping history. Both air-drying and fumigation caused a marked increase in the mineralisation of N and the amount released was related to the cropping history. Cropping caused an even greater decrease in these 'stress-labile' N reserves than in total soil N, so that cropping causes a decline in both the quantity and 'quality' of soil organic matter. Again, the decline was less where crops were grown under mulches. A term "Per cent Stress-labile N" (PSN), defined as the percentage of the total N mineralised when fumigated soil is incubated under defined conditions, is proposed as a measure of the 'quality' of soil organic nitrogen. Under secondary forest the PSN ranged from 3.4-4.2%; on cultivation it declined, in one case to less than 1%. The amount of C in the soil biomass was calculated from the size of the flush of decomposition caused by fumigation. Biomass C usually decreased on cultivation, the decrease being less under mulches. There was a close linear relationship between the flush of N caused by fumigation and the amount of biomass C in a soil and a rough measure of biomass C can be obtained by multiplying the N flush by 8. 'dagger'

Effects of deforestation on water quality.

Abstracts, 1972 Meeting of the Weed Science Society of America, St. Louis.

Marks, P. L.

Section Ecol. Systematics, Cornell Univ., Ithaca, New York
14850, USA

1972, 76-77

Languages: En

See also WA 23, 1309.

The Hubbard Brook Ecosystem Study in New Hampshire was conceived and developed as a multidisciplinary study of a well-defined, watershed ecosystem. All vegetation on watershed 2 was cut but not removed in late 1965 and herbicides applied periodically to prevent regrowth. As a result of deforestation, stream runoff was increased by 40% the first year, 28% the second year and 26% the third year. However, the stream water became 10 times more acid and there were very large increases in stream water concns. of all major ions except NH_4^+ , SO_4^{--} and HCO_3^- ; nitrate conc. increased 41-fold in the first year and 56-fold in the second year largely due to mobilization

of nitrate from decomposing o.m. The nitrate concn. exceeded established pollution levels for drinking water. The high nutrient concns., increased solar radiation and higher water temp. caused blooms of algae where none had occurred before.

The effects of herbicides in South Vietnam, Part A.
Publ: Washington, DC, USA, National Academy of Sciences.
1974, 400 pp.
Sec Jnl Source: review in Nature, UK 248, 186.
Price: \$10
Languages: En

A report prepared for the Department of Defense and the US Congress, based largely on evidence from aerial photos. An examination of the official military record showed that 10.3% of inland forests and 36.1% of the Mangrove forests were sprayed with a variety of herbicides at least once; the most commonly used herbicide was 'agent orange', a 1: 1 mixture of 2,4-D and 2,4,5-T. Mangrove forests suffered the most severe and lasting damage, and it is thought that restoration by natural regeneration may take) 100 years. It is estimated that between 0.5 and 2.0 million m3 of merchantable timber has been lost. Evidence is discussed for toxic and teratogenic effects on humans in the sprayed areas. (Cf. FA 34, 4464)

Epidemiological-ecological effects: studies on intact and deforested mangrove ecosystems.
The effects of herbicides in South Vietnam. Part B: Working papers.
Desowitz, R. S.; Berman, S. J.; Gubler, D. J.; Harinasuta, C.; Guptavanij, P.; Basuvat, C.
Sch. med., Univ Hawaii, Honolulu 96816, USA.
Publ: Washington, D. C., USA, National Academy of Sciences, 1974, 54 pp.
Languages: En
5 ref.

Data obtained in a study of intact and deforested mangrove ecosystems in South Vietnam indicate that defoliation has, directly or indirectly, altered the epidemiological patterns, particularly with regard to vector-borne diseases. The potential health hazard resulting from adverse

changes in the populations of the vectors and reservoirs of diseases, as in the case of the anopheline vectors of malaria, underlines the need to continue and expand the studies and to establish teams of medical scientists to identify and advise on the management of health problems.

The estimation of evapotranspiration in the Amazon basin.
Villa Nova, N. A.; Salati, E.; Matsui, E.
Escola Superior de Agricultura 'Luiz de Queiroz',
Piracicaba, Sao Paulo, Brazil.
Acta Amazonica, 1976, 6, 2, 215-228
Languages: Pt Summary Languages: en
17 ref.

Describes an attempt to estimate the magnitude of the main components of the water balance in the Amazon basin. In view of the lack of sufficient meteorological and hydrological records for the region, some data from other countries were also used. An energy balance was drawn up, and from this the regional water balance was established, using the Penman method adapted to forest conditions. Actual evapotranspiration in the region should be very close to the potential evapotranspiration, and the average value was found to be ca. 4 mm/day. It was tentatively concluded that the Amazon basin receives 14.4×10^{12} m³ water/year through precipitation, this total being balanced by a surface discharge of 5.5×10^{12} m³/year and evapotranspiration amounting to 8.9×10^{12} m³/year. Since transpiration by plants represents 61.8% of the water balance, intensive deforestation will apparently bring about alterations in the hydrological cycle.

Descriptors: Brazil, Amazonia; hydrology; evapotranspiration; forest influences (on); hydrological factors
Brazil
DC No: 116.13 + 116.1/2 + 161.16 + 907.3
Subject Codes: F1161

The feasibility of wood-gas engines for developing countries.
Wendorff, G. B. von
Inst. f. Weltforstwirtschaft., Reinbek b. Hamburg, German
Federal Republic

Tropenlandwirt, Zeitschrift für die Landwirtschaft in den Tropen und Subtropen, 1976, 77, 77-92

Languages: De Summary Languages: en
35 ref.

Describes a 'pre-feasibility' study in 3 (unnamed) countries giving representative examples of (a) tropical African savannah, (b) an African rain forest, and (c) the Caribbean region, which examined the economics (relative costs of energy etc.), potential supplies (from natural forests, plantations, mill residues etc.) ecological hazards (deforestation, fires, pollution etc.) technology, legal aspects, etc. It is concluded that the introduction of wood gas generators is a promising alternative technology for rural stationary engines and agricultural tractors in the countries studied. The threat of forest devastation is considered negligible.

Firewood at Niamey.

Delwaulle, J. D.; Roederer-

Bois et Forests des Tropiques, 1973, No. 152, 55-60

Languages: Fr Summary Languages: en, es

Discusses the problem of firewood supply and demand for this town of not less than 70,000 inhabitants in SW Niger, with particular reference to the sources of supply, the felling, handling and transport of the wood, and the consequences of deforestation.

Forest-Savanna border zone in West Africa. A landscape ecological analysis.

De bos-savannegrens in West-Afrika, een landschapsekologische verkenning.

Tjallingii, S. P.

Bot. Lab., Univ. Utrecht Netherlands.

Geografisch Tijdschrift, 1976, 10,3/4, 193-212

Sec Jnl Source: Abstracts on Tropical Agriculture 3 (4) 14251.

32 ref.

A general description is given of the tropical rain-forest and savanna ecosystems. Rainfall and temp. are responsible for this differentiation in vegetation. Relief and soil type have an important influence on either forest or

savanna only in the transitional zone. Man's influence tends to narrow the transition to abrupt boundaries and works in favour of savanna development by burning and farming, even if climatic changes would favour natural forest development.

Forestry and water catchments in relation to mining activities
Beggs, B. J.
Special Publication, Australian Conservation Foundation,
1972, 8, 41-48
Sec Jnl Source: Geo Abstracts 74B/0585. ORS.

Languages: En

Presents a report on the forests of W. Australia, showing that the main problem after clearing vegetation from catchments is the resultant increase in salinity. At present, the main threat to the area is from bauxite mining and, in terms of legislation, mining has precedence over forestry. Reforestation after mining is examined and the need for further research into the problems involved is stressed. Some recommendations are made to protect state forest not already allocated to mining.

Forestry in the Seychelles (with two separate volumes of appendixes).
Henry, P. W. T.
Surrey, Surrey, UK.
Land Resource Report, Land Resources Division, Ministry of Overseas Development, 1976, No. 8, xiii + 346 pp. + 4 maps, 6 pl.
Languages: En
31 ref.

Describes the climate, geology, soils, water resources, vegetation, land use, land tenure and population of the Seychelles and reviews the history of deforestation and the establishment of the present forest plantations. The composition and extent of the plantations are shown in maps at scale 1:5000. Sample plots laid down in a variety of stands indicated the present availability of timber, the volume increment and the likely rotation for timber production. Estimates of volumes were made in some of the semi-natural woodlands. Recommendations are made on future management of the plantations, with

the aim of meeting the projected internal requirements of timber in 2002. Appendices include rainfall data, analysis of the age composition of plantations within the Production Working Circles, volume tables of plantation species, and notes on individual forests including stand descriptions and prescriptions.

Forestry problems in Burundi.
Problemes forestiers au Burundi.
Pouilloux, C.

Bois et Forests det Tropiques, 1976, No. 170, 21-34
Languages: Fr Summary Languages: es, en

A general account of the country, illustrated by sketch maps and photographs, including notes on climate, relief and natural vegetation. Deforestation is severe, leading to soil erosion and a shortage of forest products. Attempts at reforestation have been made with a wide range of species, of which Eucalypts are the most important. Recommendations are made for renewed efforts to increase the planting of exotics, to protect the remaining natural stands (especially those of scientific interest) and to try to effect a change in public opinion towards forestry.

Geographical extension in a new ecological association of *Panstrongylus humeralis* (Hemiptera: Reduviidae), natural host of *Trypanosoma cruzi* in Panama.
Sousa, O. E.; Adames; A. J.
Gorgas Memorial Laboratory, PO Box 2016, Balboa Heights, Panama Canal Zone.
Journal of Medical Entomology, 1977, 13, 6, 748-749
Languages: En
6 ref., 2 fig.

During a study of potential disease vectors in 1972-75 in the wooded area of the Bayano River Hydroelectric Project in eastern Panama, *Rhodnius pallescens* Barber, *Triatoma dimidiata* (Latr.), *Eratyrus cuspidatus* Stal, *Panstrongylus geniculatus* (Latr.) and *P. rufotuberculatus* (Champ.) were trapped by various methods. In 1975, *P. humeralis* (Usinger), a rather rare species previously known only in the type-locality of Barro Colorado Island in the Canal Zone where the rainfall averages well over 2000 mm, was caught for the first time in the dryer Bayano River area, possibly

because of the extensive deforestation resulting from the construction of the new lake basin. Adults of *P. humeralis* collected in February 1975 were found to contain epimastigotes and trypomastigotes resembling those of *Trypanosoma cruzi* in the intestinal tract. Suckling mice were successfully inoculated with these parasites from a single bug either intracerebrally or intraperitoneally, and the strain was isolated in cultural media and maintained by intracerebral inoculation of blood trypomastigotes through 10 successive mouse hosts without losing its virulence, killing the hosts in 8 - 13 days. These results indicate the probability that *P. humeralis* is involved in the spread of Chagas' disease in Panama.

Habitat values and endemicity in the vanishing rain forests of Sri Lanka.

Senanyake, F. R.; Soule, M.; Senner, J. W.

California Univ., Davis, USA.

Nature, UK, 1977, 265, 5592, 351-354

Languages: En

18 ref.

An attempt is made to express quantitatively the value or uniqueness of particular habitats in Sri Lanka in order to make an objective case for their conservation. Indices of habitat values of 4 defined biogeographical regions were calculated for a large number of endemic amphibia, lizards and birds. Results indicate that the rain forest areas together with the montane regions in the south contain more endemic forms than any other part of the island. Deforestation is rapidly destroying these habitats: at present only 9% of land in the wet montane regions remains forested.

How the wise men brought malaria to Africa.

Desowitz, R. S.

Natural History, 1976, 85, 8, 36, 38, 42, 44

Languages: En

This is a popular account of the rapid spread of malaria due to human activity. The replacement of traditional subsistence agriculture tends to increase the availability of suitable habitats for the vector mosquitoes, particularly after the introduction of rice

cultivation, deforestation and irrigation systems.

The importance of the montane conifer forests of central Mexico and the dangers to their survival.

Ern, H.

Umschau, 1973, 73, 85-86

Sec Jnl Source: Berichte Biochemie und Biologie (1973)

385. 1029. De. Reinbek.

Languages: De

Stresses the need for protecting the conifer forests of E. Central Mexico from progressive destruction by a rapidly increasing rural population, with special reference to the high-altitude stands of *Pinus hartwegii* on the great volcanoes and the *Pinus patula* forests on the edge of the plateau; the latter are important in their hydrological role as fog condensers.

Introduction to tropical phytogeography. I. Flora and structures. 2. Habitats and plant groups.

Introduction a la phytogeographie des pays tropicaux. I. Les flores - les structures. 2. Les milieux - les groupements vegetaux.

Schnell, R.

Publ: Paris, France: Gauthier-Villars.

1970, 449 pp.; 951 pp.

Languages: Fr

many ref., many pl.

In his introduction to these two volumes Professor T. Monod reminds us of how different our concepts of botany might be if the science had developed in the tropics rather than in temperate and Mediterranean zones. This book helps to redress the balance by reminding us of the exuberance and diversity of tropical plants. It is based on the author's wide experience, initially in West Africa, and later extended to other parts of the tropical world. The book is divided into 4 parts, viz: 1. Tropical flora. 2. Structure and biology of tropical plants. 3. Plants and intertropical habitats. 4. Types of intertropical vegetation and their dynamism. There are many clear maps and line drawings. The numerous photographs (a few of which are, unfortunately, rather dark) illustrate the tropical vegetation of Africa, America and Asia. There are detailed alphabetical indexes.

All those concerned with tropical vegetation will read this book with great interest, and will return to it as a source of reference. Horticulturists will note that many of their fruit trees (for instance, durian, coconut and brazil nut) are mentioned. They will find outlined the successful dissemination of food plants and ornamentals by man, together with the alterations in floral composition brought about by the selective preservation of favoured species. They will be reminded of the natural habitat of many epiphytic ferns, orchids and bromeliads which are now familiar species of temperate commercial horticulture. Many of the photographs indicate the marked changes brought about by increased deforestation and cultivation. This, and the author's evident sympathy for his subject inevitably create a sense of disappointment that there is no chapter on conservation and the preservation of selected habitats. That man-made changes need not always be in the same direction is well illustrated by Figs 189-191, inclusive, which contrast the different aspects of areas of an African savanna submitted to late and early burning treatments with another area given fire protection. The reading of this comprehensive and stimulating book will undoubtedly encourage further thinking along these lines. D.O'D. BOURKE.

Man-biting Simuliidae (Diptera) of northern India.

Lewis, D. J.

c/o British Museum (Natural History), London, UK

Israel Journal of Entomology, 1974, 9, 23-53

Languages: En

63 ref., 32 fig.

Simulium indicum Becher is discussed in detail. It has been recorded from 8 countries, from Pakistan to Thailand. The female is redescribed. It is an important biting pest of man and could possibly be a vector of human onchocerciasis. It inhabits mountainous areas between 100 m in the east and 700 m in the west up to 3000 m. It has probably retreated in some areas as a result of deforestation. The male of *S. nodosum* Puri is described for the first time, and supplementary notes on the female, pupa and larva are presented.

Policy on utilization of tropical forest in the Ivory Coast.

Forstpolitische Überlegungen zur Tropenwaldnutzung in der Elfenbeinküste.

Schmithusen, F.

FAO, Rome, Italy.

Schweizerische Zeitschrift für Forstwesen, 1977, 128, 2, 69-82

Languages: De

Summary Languages: fr

It is estimated that in the tropical forest zones of the world, 10 million ha of forest, yielding 80-100 million m³ of high-value timber, are cleared annually. In the Ivory Coast, the area of forest is thought to have decreased by 300 000 ha/year in 1955-65. By 1974 it had fallen to 40% of its original extent. The economic implications of the clearing of virgin forest and destruction of valuable timber stocks is discussed. The need is emphasized for rational utilization of forest raw material potential on a continuing basis, beyond initial exploitation, since the needs of the home market are likely to increase and destruction of forest with a protective function will result in further costs.

Possible climatic impact of tropical deforestation.

Potter, G. L.; Ellsaesser, H. W.; MacCracken, M. C.;

Luther, F. M.

Nature, UK, 1975, 258, 5537, 697-698

Languages: En

6 ref.

Presents a revised two-dimensional atmospheric model (ZAM2) to stimulate (a) present conditions with a rain-forest albedo of 0.07; (b) the effect of complete removal of tropical rain forest, accompanied by an increased run-off rate, decreased evaporation rate and an albedo of 0.25; and (c) an intermediate situation simulated by complete removal of the forest accompanied only by an increase of the albedo to 0.25. The possible consequences indicated by the model runs are discussed, and data are presented for the resulting global water budget and mean precipitation and temperature changes.

Project S.4 - species trials. Final report.
Fahlman, R.

Res. Sec., For. Dep., Sarawak.
Report, Silvicultural Research Section, Forest Department,
Sarawak, 1975, No. S.R.7, i + 26 pp.
Languages: En
6 ref., 8 maps

A report on trials of 12 exotic species (mainly pines) in several districts of Sarawak, established in 1964-68 and evaluated up to 1975. The sites were on deforested land poor in nutrients. The growth (tabulated) of all species was poor through *Pinus insularis* (*P. kesiya*) grew exceptionally well in one plot near Sibu. *P. caribaea* var. *hondurensis* generally grew best, followed by *P. caribaea* var. *bahamensis*. Results confirmed the unsuitability of sites covered with *Dicranopteris linearis* for pines.

The protective role of forestry to the land.
Ghosh, R. C.

Publ: Dehra Dun, India; Forest Research Institute &
Colleges
1974, 14 pp.
18 ref. Prepared for the 10th Commonwealth Forestry
Conference 1974

Describes the physiography, climate and vegetation of mountains and hills in various regions of India, and presents data for size of drainage area, maximum discharge, and run-off from 13 important Indian rivers. Most of the catchments areas are forested, and the effects or large-scale destruction of forests and removal of leaf litter on flooding and soil erosion are considered. The remainder of the paper discusses the need for extensive areas of poor-quality forests to be replaced by plantations, and for forests and plantations in sensitive catchment areas to be managed not only for timber production but also for land protection.

Reforestation in the Republic of Vietnam.
Swanson, C. W.
Journal of Forestry, 1975, 73, 6 367-371
Languages: En
5 ref.

Briefly reviews the forest types, causes of deforestation and the areas that need reforestation in S. Vietnam. More than two million ha of forest land need reforestation, and by 1974 plantings had reached 15 000 ha/year. Contrary to popular opinion, the author attributes most of the deforestation to factors other than war, e. g. shifting cultivation, agricultural concessions, wildfires, etc.

Regeneration and afforestation techniques in China.

Kato, R.

Ringyo Gijutsu (Forestry Techniques), 1974, No. 391, 10-13

Sec Jnl Source: Referativnyi Zhurnal (1975) 4.56.140.

Ru. BLL.

Languages: Ja

The main timber reserves are contained in residual natural forests in NE and SW China (e. g. coniferous/broadleaved forest on the southern slopes of the Little Hingan Mts., with *Pinus koraiensis*, *picea jezoensis* and *Abies nephrolepis* predominating). Details are given of the felling systems being used in these forests and in unproductive secondary forests consisting of *Quercus mongolica* and *Betula nigra*, and of programmes for their regeneration and for the afforestation of deforested mountain areas, including species recommended for different parts of the country, standards or planting stock, methods of planting or directing sowing, spacing, and the tending of young plantations.

Resource development in semi-arid lands.

Hutchinson, Sir J.; Bunting, A. H.; Jolly, A. R.;

Pereira, H. C. Perry, R. A.; Robertson, V. C.;

Hadley, R. F.; Tribe, D. E.

Philosophical Transactions of the Royal Society of London, B 1977, 278, 962, 437-614 ISBN 0-85403-088-3

Price: 12

Languages: En

many ref., 2 pl.

A collection of 13 papers presented at a Royal Society Discussion Meeting on 17-18 March 1976, including; Perry, R. A. The evaluation and exploitation of semi-arid lands; Australian experience. (33 ref.) Includes descriptions of

vegetation types and discusses their suitability for grazing. Robertson, V. C. Experience in the Middle East. - An assessment of the present hazards in agriculture, including a warning on the destruction of forests in Iraq and Iran. Hadley, R. F. Evaluation of land-use and land-treatment practices in semi-arid western United States. (20 ref.) Pereira, H. C. Land use in semi-arid southern Africa. (21 ref.) Emphasizes the importance of watershed management in the improvement of resources. Water conservation by control of woody plants is considered in the discussions. Tribe, D. E. The conservation and improvement of resources: the grazing animal. (64 ref.) Coordination of livestock and rangeland research and development is urged, with reference to the presentsituations in Australia and sub-Saharan Africa.

The savannas of the Valley of Caracas.
Vareshi, V.

Acta Botanica Venezuelica, 1969, publ. 1970, 4, 427-522
Sec Jnl Source: Berichte Biochemie und Biologie (1971)
349, 77. De. NLL.
Languages: Es

Describes and classifies the largely treeless savannas of the region and thier ecology. From pollen-analyticcal studies it seems probable that most of the area was once under forests dominated by species of Podocarpus, and that deforestation had started befoe the advent of Columbus.

A study of climate and forests in the Ranchi Plateau.
Part I. (Changes over the period: 1889-1943). Part II.
(Analysis of climatic data.).

Warren, W. D. M.
Indian Forester, 1974, 100, 4:5, 229-234; 291-314
Languages: En

A detailed analysis of climatic data for this region of Bihar, India, with some discussion of the effects of deforestation on climate and the mutual interrelations of forest and climate.

Tropical ecosystems: state and targets of research into the ecology of humid tropical ecosystems.

Brunig, E. F.

Plant Research and Development, 1975, 1, 22-38

Languages: En

26 ref.

Discusses the present inadequate state of ecosystems research in developing countries, including projects associated with the International Biological Programme and the UNESCO MAB (Man and the Biosphere) projects. The Amazonia development project of the Brazilian Government is used to illustrate the potential risks (e. g. to the soil, the climate and the atmosphere) inherent in large-scale destruction of forests.

SECTION III: SOME ARTICLES OF INTEREST

Ako s nahradami skod za odlesnenie?; How to compensate for
damage by deforestation

Melicherik, J.
Les (bratislava) 28 (2): 67-70. February 1972
99.8 L5632

Assessment of the use of forests as sinks for the removal of
atmospheric sulfur dioxide

Murphy, C. E., Jr.; Sinclair, T. R.; Knoerr, K. R.
J Environ Qual 6 (4): 388-396. Ref. Oct/Dec 1977
QH540.J6

Arrestiamo la distruzione delle foreste; Let us stop destruction
of forests. Pollution, fires, conservation.

Bertucci, B. M.
Lotta Antiparassit 27 (2): 3-5. February 1975
79.8 L91

Bibliography: Some references relating to the effects on soil con-
ditions of the clearing and agricultural development of Tropi-
cal forest areas (1969--1959)

Commonwealth Bureau of Soils
Commonw Bur Soils (Annot Bibliogr) 1399, 11 p. 1970
241 C734A

Biological perspective of deforestation

Palaypayon, W. R.
Canopy 3(2): 13-14. February 12, 1977
SD1.C36

Clearcut; The deforestation of America

Wood, Nancy C.
San Francisco, Sierra Club 151 p. illus. 21 cm. .c1971.
SD538.2.A1W65
Series: The Sierra Club battlebook series, 3

Coming to Terms with the Rain Forest

Irwin, Howard S.
Garden J. May-Jun 77, V1, N2, P29 (6)

Feature article: Brazil's program of nat'l integration seeks to exploit the wealth of the amazon through highway construction, agricultural colonization, mining, forestry, and eventual industrialization. But the attempt to settle the amazon has exposed the fragility of the rain forest and the illusion of its wealth. The value of most products in the amazon, such as sugar, is low, while the cost of obtaining the products is high, production costs include fuels, importation of machinery, and fertilizers and pesticides that place the local society at the mercy of international economic forces and that finally exact, by soil erosion and laterization, the irreversible destruction of the forest ecosystem. These negative impacts must be realized if development of the amazon is to have any chance of success. (1 diagram, 1 map, 4 photos, 1 table)

Comparative advantage or disadvantage of land clearing; Economic study on the alternative use of land to agriculture or forestry on pioneer farms in Finland by a Finnish study group

Helsinki, Universitet, Maatalouspolitiikan Laitoksen; U. S. Dept. of Agriculture
Helsinki, University of Helsinki 161 l. illus. 1969
HD1741.F5H4

Control of forest growth and distribution on wet tropical mountains: with special reference to mineral nutrition

Grubb, P. J.
Annual Review of Ecology and Systematics 1977 8:83-107

Desforestacion y erosion; Deforestation and .soil. erosion Mexico,
Central America.

Laviada, I
Mex For 50 (5): 27-28. Sept/Oct 1976
99.8 M57

Le deforestation mecanique pour la creation de palmeraies industrielles;
(Mechanical deforestation for the creation of industrial palm
plantations). Tropical agriculture.

Martin. G.
Mach Agr Trop 28: 23-29. Oct/Dec 1969
58.8 M186

La destruction des forets et des soils en pays tropical; Destruction
of forests and soils in a tropical country.

Aubreville, A.
Adansonia 11(1): 5-39. 1971
450 AD14

Destruction of tropical ecosystem via overpopulation and agricultural
methods

Croat, Thomas B.
Bioscience, August 1972, v. 22, n.8:465(3).

Devastation on the Amazon

Anderson, Alan
Organic gardening and farming, Nov 1972, v.19,n.11:90(4).

Economics of clearing tropical rain forest in Dominica

Russell, J.
World Crops 25 (6): 317-318. Nov/Dec 1973
281.8 W892

Effect of clearing on the soil arthropods of a Nigerian rain forest

Lasebikan, B. A.

In Progress in Soil Zoology; Proceedings of the International
Colloquium on Soil Zoology 5th: 533-544. Ref. 1973 (pub. 1975)
QL110.I5 1973

Effects of clearing and cropping on the organic reserves and biomass
of tropical forest soils

Ayanaba, A.; Tuckwell, S. B.; Jenkinson, D. S.
Soil Biol Biochem 8(6): 519-525. Ref. 1976
S592.7.A1S6

Effects of clearing by poisoning, as against felling and burning, on
plantain and cocoyam yields on acid Ghana forest soils

Ahn, P. M.
Ghana J Agr Sci 3 (2): 93-97. Dec 1970
S19.G5

Effects of clearing in a tropical rain forest on the composition of the
coprophagous scarab beetle fauna (Coleoptera) .Scarabaeidae.

Howden, H. F.; Nealis, V. G.
Biotropica 7(2): 77-83. July 1975
QH301.B52

Effects of pinyon-juniper .pinus edulis-juniperus. removal on natural
resource products and uses in Arizona. .Watershed management.

Clary, W. P.; Baker, M. B., Jr.; O'Connell, P. F.; Johnsen, T. N. Jr.;
Campbell, R. E.
U. S., Rocky Mountain Forest and Range Experiment Station
U S For Ser Res Pap RM (Rocky Mt for Range Exp Stn) 128, 28 p.
Maps. Ref. Oct 1974
A99.9 F7632U

Energy from Biomass: Some general reflections

Poole, Alan D.

Presented at Institute of Gas Technology Sym on Clean Fuels
from Biomass and Wastes, Orlando, January 25-28, 77, p 441 (23)

Survey Report: The near-, mid-, and long term picture for biomass energy is surveyed. The use of biomass for energy is inextricably connected to the problem of deforestation in developing nations. It may be possible to develop small ammonia plants capable of using biomass as a feedstock. Factors that favor the use of biomass for energy in developing nations over its use of industrial nations are discussed. A somewhat tentative analysis of the classical challenge between food and fiber vs. biomass production concludes that an upper limit of area available for biomass might be from 200-500 million ha, producing anywhere from 5-20 billion tons. (16 references)

Epidemiological-ecological effects: studies on intact and deforested mangrove ecosystems. .Herbicides, insects, vectors, human diseases

Desowitz, R. S., Berman, S. J., Gubler, D. J., Harinasuta, C.,
Guptavani, P., Vasuvat, C.

In the Effects of Herbicides in South Vietnam National Research
Council Comm on the Eff of Herbicides on Vietnam pt. B(v.9), 54 p.
maps. Feb 1974
SB951.4.N3

Estimacion de la deforestacion y la reforestacion necesaria; Estimation of the deforestation and reforestation necessary in Guatemala

Mittak, W. L.

Agronomia (Guatem) 12: 5-26. Sept/Oct 1976
S539.G95A3

Forest-climate interaction in Andaman and Nicobar Deforestation
Sarker, R. P., Kelkar, R. R.

Indian Farming 26 (11): 69-71, 73-74. Feb 1977
22 IN283

Forest destruction: 700,000 hectares of forests are destroyed every year in Colombia

Munoz, H.
Soc Antioquena Agr Bol Agr 582: 11368-11369. Feb 1969
9.4 S01

Haiti Losing Fight Against Erosion

Riding, Alan
New York Times June 23, 74 P15

Herbicides in war, current status and future doubt

Westing, Arthur W.
Biological conservation, Oct 1972, v.4n.5:372(6)

How the Thais are solving their kaingin problem. Destruction of forests through shifting cultivation.

Hilario, F. A.
Canopy 2(4): 7, 10. Apr 1976
SD1.C36

Metamorphoses de la Champagne crayeuse; Deboisement et equilibre biologique; Changes undergone by the cretaceous province of Champagne: Deforestation and biological equilibrium

Chevalier, Y.
Rev Forest Franc 25(4): 303-310. map. July/Aug 1972
99.8 R329

El Mexico de nuestros hijos; The Mexico of our children. Brief history of deforestation.

Lopez, Lara A.
Mex For 50 (2): 14-15. Mar/Apr 1976
99.8 M57

Odlesnovanie k prospechu lesa; Deforestation for the benefit of the forest .Soil management.

Nad, J.

Les (Bratisl) 31 (7): 303-305. July 1975

99.8 L5632

The Other Energy Crisis: Firewood

Eckholm, Erik P.

Ecologist, Mar-Apr 76, V6, N3, P80 (7)

El peligro de los desmontes; The danger of deforestation

Sosa, A. H.

Mex For 49 (1): 3-8. Jan/Feb 1975

99.8 M57

Perdidas de materia organica, nitrogeno, fosforo y potasio por efecto de la deforestacion en suelos del area andina de Narino, Colombia. (Losses of organic matter, nitrogen, phosphorus and potassium from deforestation in Andean soils of Narino, Colombia)

Guerrero, R. R., Gamboa, J. J., Blasco, L. M.

An Edafol Agribiol 34 (1/2): 11-24. Ref. Eng. sum Jan/Feb 1975

506 SP12

Possible Climatic Impact of Tropical Deforestation

Potter, G. L., Ellsaesser, H. W., MacCracken, M. C., Luther, F. M. Nature, Dec 25, 75, V258, N5537, P697 (2)

Technical Report: Of the many possible human-induced changes in the planetary climate, the removal of tropical rain forests to increase arable acreage appears most imminent. This possibility was examined in a two dimensional (zonal) atmospheric model that uses basic conservation equations and parametrises the meridional transport by horizontal eddies employing both model dependent and prescribed coefficients. The chain of consequences following tropical rain forest removal includes overall global cooling and reduced precipitation. (3 graphs, 1 table)

Potential of Bio-Gas Plants and How to Realize It

Parikh, Jyoti K., Parikh, Kirit S.
Intl Inst for Applied Systems Analysis, Austria
Presented at UN Inst for Training and Research Seminar
on Microbial Energy Conversion, W Germany, Oct 76, P555 (37)

Reforestation in the Republic of Vietnam

Swanson, Carl W.
J Forestry, Jun 75, V73, N6, P367 (5)

Survey Report: More than 2 million ha of forest land need reforestation in S. Vietnam. Contrary to popular opinion, the deforestation of most of this large area is due to forces other than war, although warfare has taken its toll. Use of modern reforestation methods combined with methods long used in Southeast Asia has resulted in an increase in annual accomplishments from practically none in 1971 to 15,000 ha in 1974. Causes of deforestation in Vietnam and recent reforestation efforts are discussed (3 photos, 1 table)

Reforesting the Earth

Eckholm, Eric
Futurist, Feb 76, V10, N1, P35 (5)

Survey Report: An overview of the world's forest resources emphasizes the continued loss of forest land primarily to land clearing for agriculture and wood gathering for fuel. Farming techniques, including shifting cultivation and slope terracing, and governmental policies, such as settlement colonizing on hilly, arid, and tropic terrains, are described. Resultant problems of erosion, floods, and nonworkable grasslands are enumerated. Government sponsored reforestation programs in India and China are discussed. Tree planting everywhere, on both a personal and governmental level, is urged (7 photos)

Salting the Earth

Eckholm, Erik P.
Environment, Oct 75, V17, N7, P9 (7)

Survey Report: Soil salinity, usually caused by mismanaged irrigation, is undermining to varying degrees the productivity of at least one-third of the world's irrigated land. At the same time, many dams and water channels are clogged by silt loads as deforestation and improper farming practices upstream accelerate erosion, waterlogging and salinity in Iraq, Pakistan, India, Iran, Indonesia, and the Philippines are described. Although the world's irrigated area expanded by nearly 3%/yr from 1950-1970, it will probably grow at little more than 1%/yr in the remaining years of the century. The insidious loss of irrigation capacity to salt and silt is sure to be finally recognized as the serious global threat that it is. (5 photos, 23 references)

Solo miseria deja el bosque a Tarahumaras; (Only misery left in the forest at Tarhumaras), Melgoza Paralizabal, A.

Mex For 50 (2): 18-21. Mar/Apr 1976
99.8 M57

Tinkering with the Clouds

Dernbach, John
Progressive, Oct 76, V40, N10, P44 (4)

Feature Article: Inadvertant climate modification may be the greatest environmental threat. The five basic interdependent factors involved with climatic changes are: heat, particulates, gaseous emissions, water vapor, and land and water surface changes. Deliberate weather modifications may also have unforeseen side-effects. The lack of adequate knowledge of natural climatic changes and human impact on them have prompted NAS to recommend increasing federal climate related research money from the present \$18 million/yr to \$67 million/yr by 1980. Two plans before Congress in 1976 would implement the kind of scheme set forth in the NAS report. (2 drawings)

Twenty-two dimensions of the population problem

Brown, Lester, R., Stokes, Bruce, McGrath, Patricia L.
Population Reports, Nov 76, Series J, N11, P177 (18)

Survey Report: The single-minded focus on demographic analysis in problems of population growth has been at the expense of many other consequences of population growth that might concern economists, ecologists, meteorologists, political scientists, urban planners, and many other specialists. Twenty-two dimensions of the population problem not usually treated by demographers are identified and reviewed. Some of the topics include: literacy, ocean fisheries, natural recreational areas, pollution, inflation, environmental illness, and hunger. (4 graphs, 9 photos, 43 references, 1 table)

The Urgent Need for Forest Conservation in Highland Guatemala

Veblen, Thomas T.
Biological Conservation, Feb 76, V9, N2, P141 (14)

Technical Feature: Highland Guatemala is one of the very few tropical regions of the world with conifers, especially pines, well-represented in the flora. This valuable genetic resource is presently being threatened by an alarming rate of deforestation and rapid Guatemalan population growth. This history of forest destruction dates back to 18th century erosion from sheep over-grazing. Preservation of the arborescent flora of highland Guatemala requires establishing seed banks and planting conservation stands. (1 map, 3 photos, 61 references, 1 table)

Wood vs. Fossil Fuel as A Source of Excess Carbon Dioxide in the Atmosphere: A Preliminary Report

Adams, J. A. S., Mantovani, M. S. M., Lundell, L. L.
Science, Apr 1, 77, V196, N4285, P54 (3)

Technical Report: If the amounts of wood consumed in deforestation and as firewood in underindustrialized countries are added to the amount consumed by money economies as forest products, estimates of the net amount of wood removed from the biosphere in this century should be revised upward. The per capita ration of the weight of carbon from net wood burned to the weight of carbon from fossil fuel burned in this century has been at least 0.1 and may have approached 1.0. Prudent concern for the future would suggest a

need to reexamine: the quantitative aspects of net deforestation and wood burning. As they affect the amount of carbon dioxide in the atmosphere; and the possible effects of the buildup of atmospheric carbon monoxide. (1 diagram, 15 references, 1 table)

World Population Trends: Signs of Hope, Signs of Stress

Brown, Lester, R.
Population Reports, Jan 77, Series J, N13 (15)

Special Report: The growth in the world population has begun to slow in the 1970's - a reversal of a longstanding trend. The decline by one-third of the U. S. growth rate from 1970-75 was a positive and not widely anticipated event. Tragically, in some poor countries, population growth is checked by hunger-induced rises in death rates. The recent hand to mouth situation contrasts sharply with the relative security of the 1950's and 1960's. Population trends from 1970-75 are surveyed, and the rise in death rates in some countries is documented. U. N. projections show world population increasing from 4 billion to some 10-16 billion before eventually leveling off. But many ecological systems are already breaking down from population strains. (1 graph, 10 photos, 31 references, 6 tables)

Worldwide Perspective

King, K. F. S.
American Forests, Apr 76, V82, N4, P12 (7)

Technical Feature: Some main issues of world forestry for the next 25 years are considered, and areas of future concentration are suggested. Population growth, increased demand for forest products, land use for food and forest production, world economic activity growth, forestry in developed and developing countries, multiple use forestry, and inefficiency in forestry productions are described. Needed research, forest fertilization, improvements in wood productivity, and forests as a source of chemicals, polymers, and liquid fuels are discussed. (1 photo)