FORESTRY RESOURCES DEVELOPMENT ASSISTANCE:

A Selective Bibliography of Reports

U.S. Agency for International Development (A.I.D.)

FORESTRY RESOURCES DEVELOPMENT ASSISTANCE:

A SELECTIVE BIBLIOGRAPHY OF REPORTS

Produced jointly by:

Office of Development Information and Utilization

Office of Science and Technology

Office of Agriculture

Bureau for Development Support
Agency for International Development

November 1980

INTRODUCTION

Forestry Resources Development Assistance: A Selective Bibliography was developed to help inform and orient A.I.D. personnel and U.S. Peace Corps representatives who are involved in or contemplating involvement in forestry and related natural resources projects.

The reports that have been abstracted in Forestry Resources Development vary in origin, scope, and technical detail. Both A.I.D. and non-A.I.D, and both general and technical reports have been included. All listed reports, however, have two things in common: they are all retained in the A.I.D. Development Information Center and they all are available for on-demand distribution to A.I.D. and overseas U.S. Peace Corps representatives through the Center. An order form for the use of the A.I.D. and U.S. Peace Corps representative working overseas has been included in this bibliography.

We hope that the recipients of this bibliography will find it useful. If there are any other subjects that you think should be covered in future Development Information Center bibliographies, we will be pleased to receive your suggestions. Send your suggestions to:

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SECTION I

GENERAL WORKS

1. Bene, J.G., H.W. Beall, and A. Cote. Trees, Food, and People: Land Management in the Tropics. International Development Research Centre, Ottawa, Canada. IDRC Report IDRC-084e. 1977, 52 p.

DIC Catalog Number: 634.92 B461

The world's tropical forests are simultaneously overexploited and underused. This report on land management in the tropics was undertaken to identify priority areas of research in the quest to both preserve and enhance the productivity of tropical lands. Although tropical forests are potentially the most productive ecosystems on earth, they are the least understood, and the most endangered. It is predicted that within the next 25 to 30 years, the pressures from surrounding human populations for food and fuel will destroy most of the existing humid forests. Except for a few special types of forests, economical methods of tropical forestry management have not yet been developed. The authors recommend that first priority be given to the development and testing of combined production systems, which integrate forestry, agriculture, and/or animal husbandry. Fuel needs are another important consideration in land management. It has been demonstrated many times that tree species carefully chosen for quick growth and adaptability to local soils and climate will yield a large volume of wood in a short time. Nevertheless, it should be noted that monocultures are generally more vulnerable to specific diseases and insects than mixtures. Another kind of attack on tropical forests is coming from loggers in search of a few, highly valued trees for export. Too often the best species are cut, and only the worst are left to reproduce. Exports of tropical wood to industrialized countries are increasing rapidly. However, it is the industrialized countries who are dictating both the levels of output and prices. Local and regional markets must be developed to counter this imbalance, and valued species must be protected. Another endeavor critical to the maintenance of tropical forests is their inventory and classification. Little more than 10 percent of the earth's tropical forests have been inventoried. Future inventories should include land use and other relevant data such as estimates of population density, the extent and kinds of shifting cultivation and length of fallow period, the distribution of food-producing trees, and the accessibility of forests to population centers. The authors recommend that an international council be established to sponsor, assist, and coordinate tropical agroforestry research.

2. Biological and Sociological Basis for a Rational Use of Forest Resources for Energy and Organics; Proceedings of an International Workshop held at Michigan State University, East Lansing, Michigan, May 6-11, 1979. Proceedings published by the Southeastern Forest Experiment Station, Forest Service, U.S. Department of Agriculture, Asheville, North Carolina. 1979, 193 p.

DIC Catalog Number: 634.9 B789
Publication Number: PN-AAG-859

The increasing use of wood for energy purposes has many socio-economic and environmental implications, and raises important technical questions concerning the growth, management, harvest, and regeneration of trees grown for fuel. This document is the product of an international workshop sponsored by the Man and the Biosphere Program (MAB) Committees of Canada, Mexico, and the United States. (The workshop was held at Michigan State University from May 6 through 11, 1979, and was attended by participants from both developing and developed nations.) It is comprised of a series of reports, focusing on the socio-economic consequences of, and constraints to, the use of land and forests for energy and organics, the resulting energy input/output relations, and the environmental consequences of intensive forestry and the removal of whole trees from forests. (Organics as used in this report refers to organic acids, aromatics, drying oils, lubricants, synthetic fibers, cosmetics, dyes, animal feed, and solvents.) In addition, individual reports addressing wood use and availability in individual countries are included in the report. For example in one report, it is noted that Great Britain has approximately two million hectares of forest area. This forest area produces only eight percent of the nation's wood and wood products—requiring the rest to be imported at a very substantial cost to the economy. These figures clearly illustrate the obstacles to the use of Britain's forests for energy and organics. The report on India notes that wood is that nation's principal source of energy; however, the ability of India's forests and woodlands to continue to meet that need is questionable. Other reports concern Canada, the U.S., Mexico, Indonesia, the Dominican Republic, and Latin America. Bibliographies follow most of the reports. Five major recommendations emerged from the workshop: 1) Each nation should assess its biological potential for using wood materials for energy. 2) Each nation should develop an effective way to monitor changes in the biological productivity of forests, trees, and shrublands. 3) Institutional arrangements should be made for international exchanges of information and technology, and for the use of forests, trees, and shrublands for energy. 4) The MAB should encourage contries to select one or more small communities as sites for studies, demonstrations, and small-scale forestry operations. 5) The increasing human demands on forests and shrublands should be given priority in assessments of using wood for energy, in monitoring changes in the productivity of lands, and in designing programs to transform forests and shrublands to other uses. A list of conference participants is appended.

3. Eckholm, Erik. Disappearing Species: The Social Challenge. The Worldwatch Institute, Washington, D.C. Worldwatch Paper Number 22. July 1978, 38 p.

DIC Catalog Number: 581.5 E19

The worldwide loss of species poses a major ecological and social challenge. The number of plant and animal species on earth range from three million to more than ten million. To date, only about one and one-half million species have been recorded in scientific literature. The problem of habitat destruction exists on every continent, but is particularly serious in the humid tropics. Suffused with exceptional amounts of light, warmth, and moisture, tropical forests house a remarkable variety of ecosystems and species. A single volcano in the Philippines has a greater variety of woody plant species growing on its slopes than grow in the entire United States. Pitted against these rich habitats are land-hungry people desperately trying to carve a living from the forests. The resulting biological losses will be enormous. One of the most immediate and critical to human welfare is the shrinkage of plant gene pools available to agricultural scientists and farmers. Some scientists have proposed the establishment of preserves in which original crop varieties would be cultivated and maintained. Unlike agriculture, most forestry still depends on trees growing in the wild. However expanding demands for lumber, firewood, and paper are increasing the number of areas planted with selected, fast-growing trees. As with food crops, the collection of seeds from as many tree species and varieties as possible is essential. Yet given the length of time it takes to grow a tree and test its qualities, seed collections cannot provide anywhere near the research benefits that living forests can. In addition to lumber and food crops, numerous industrial gums, oils, dyes, pesticides, and medicines are gleaned from tropical forests. Plants or animals endangered by hunters or collectors can only be protected on a specie by specie basis. However, the major threat today is the destruction of habitats supporting large numbers of inter-dependent species -- a situation which cannot be halted specie by specie. Furthermore, this struggle to save species and unique ecosystems cannot be divorced from the broader struggle to achieve social orders which meet basic human needs. Unless national and international economic systems provide many more people with land or jobs, the dispossessed will turn to even those "legally protected" lands, trees, and animals.

4. Eckholm, Erik. Losing Ground: Environmental Stress and World Food Prospects. Report sponsored by the Worldwatch Institute with the support and cooperation of the United Nations Environment Program. W.W. Norton & Company, Inc., New York, New York. 1976, 223 p.

DIC Catalog Number: 333.75 E19

This book addresses the various ways in which the earth's delicately balanced food systems are being ecologically undermined. Deforestation, overgrazing, soil erosion and abandonment, desertification, the silting of irrigation systems and reservoirs, and the frequency and severity of flooding are major topics of discussion. In all of these situations, pressures from ever-increasing human populations are disastrously compounding the effects of such natural phenomena as droughts and floods. The author provides numerous examples of the diminishing returns which have come from attempts to coax more from the earth than is available: "A Somali nomad builds his herd to record size, but the grassland is overgrazed, his cattle grow thin and sand dunes bury pastures. A farmer in northern Pakistan clears trees from a mountain slope to plant his wheat, soon after, fields downstream are devastated by severe floods. In Indonesia, a peasant burns away luxurious hillside vegetation to plant his seeds; below, rice production drops as soil washed down the mountain chokes irrigation canals." The warning that the land's ability to serve human needs is not unlimited, and can be sometimes permanently sapped, is the continuing theme of this book. The earth's poor are both the chief ravagers and chief victims of the on-going cycle of environmental stress. The author takes into account such glaring lessons as the Dust Bowl of the 1930's, the centuries-ago disappearance of once-famed cedar forests in Lebanon, and the historical, and only recently inhibited, denudation of mountains and river basins in China. Other major topics include the recent droughts of the African Sahel, the myth of potentially unlimited productivity in the humid tropics, threats to the world's fisheries, and the politics of soil conseration. A 17-page bibliography is appended. Most of the entires date from the late 1960's to the mid-1970's.

5. Eckholm, Erik. Planting for the Future: Forestry for Human Needs. The Worldwatch Institute, Washington, D.C. Worldwatch Paper Number 26. February 1979, 64 p.

DIC Catalog Number: 581.5 El9a

This in-depth review of deforestation and its associated environmental, economic, and social implications analyzes the current global situation, the causes and effects of continued forest denudation, and successful efforts in reforestation. Forests are essential to both developed and developing countries because of the wide variety of products and necessities they afford. Based on expected rises in income and population, worldwide consumption of wood products will increase from 2.5 billion cubic meters in 1976 to 4 billion cubic meters in 1994. While demand is on the rise, productive forest lands are shrinking. In Africa, Asia, and Latin America, losses are occurring at respective rates of two, five, and ten million hectares annually. Forests are stable in North America and Europe, but concern is given to balancing competing environmental recreational, and industrial demands. Forty-seven percent of the total land area of the Soviet Union is consumed by forests; however, harvesting is commercially unfeasible and growth is slow due to remote locations and cold areas of these forests. Major causes of deforestation cited are the spread of agriculture (or cultivation), firewood collections, and operation of forestry industries. If deforestation were allowed to continue, a broad range of ill effects would result. A shortage of wood products would cause price increases and global inflation. Grain production would suffer as people use cow dung as an alternate fuel source, thus lessening the availability of fertilizers. Not the least of these maladies would be the resulting related environmental degradation. Many plant and animal species would become extinct, and climatic disruptions would occur when carbon dioxide is released into the atmosphere, otherwise stored in the abundant plants. Despite current increased efforts of reforestation programs, the pace of planting is "pitifully slow" when compared with the pace of forest loss or with estimates of future demands. This situation is described as a "transition from a period of global wealth to a period of global forest poverty." The challenge facing world forestry is not just to halt deforestation and to plant enough trees to satisfy commercial and environmental needs; basic needs of the poorest third of humanity must also be met. Through community forestry programs, such as those which have proven highly successful in the People's Republic of China, South Korea, and Gujarat, India, all of these requirements can be met. Community forestry programs are carried out by the people, who form village cooperatives affiliated with national unions. Planting woodlots and watershed varieties, practicing agroforestry, and planting idle land are among community forestry strategies which strive to reverse the trend of deforestation. To be successful these systems must have not only popular support, but also the full

cooperation of bureaucrats and local social and economic institutions. Efforts of this sort exhibit potential patterns which have yet to be emulated in many countries. Forestry-related bibliographic material (75 entries, 1967-1979) is appended to this report, including several reports by the Food and Agriculture Organization and numerous global and regional forestry resource surveys and analyses.

6. Eckholm, Erik and Lester R. Brown. Spreading Deserts - The Hand of Man. The Worldwatch Institute, Washington, D.C. Worldwatch Paper Number 13. August 1977, 40 p.

DIC Catalog Number: 333.73 W927

Discusses the problem of desertification - a term used to designate both the spreading of existing deserts and the degradation of range and crop lands in arid and semi-arid lands - in terms of its human causes and suggests ways of combating the problem.

The authors summarize the results of current research on the extent of desertification in the Sudan (where the spread of the Sahara is already legendary) and other parts of Africa, Iraq, the Middle East, India, South America, and the United States (the Navajo Reservation in Arizona and New Mexico). While the richer countries among these can absorb the effects of desertification without human tragedy, desertification for as many as 50 million of the poor means undernutrition and famine, unemployment, migration, deepening poverty and despair. Since most of those in less developed desertified lands make their living off of agriculture, declining agricultural production presents a major problem. Between 1950 and 1975, per capita food grain production declined in 12 of 16 desert countries while growing by one-third globally. Causes of this underproduction include non-use of land and water resources (although no known technology can make dryland farming as productive as farming in moist zones); land abuse (also a cause of drought); and rapid population growth.

The authors conclude by suggesting solutions to the problem of desertification based on an understanding of cultures and the economic predicament of desert dwellers who, by meeting life's necessities, often indulge in practices that cause desertification. Suggested solutions to these problems include the establishment of regional management schemes or of herding cooperatives for the livestock herds of nomads; improved agricultural methods in sedentary zones, especially the promotion of subsistence farming in place of the exclusive farming of export crops; three planting programs; improvement of local grain reserve facilities; and programs to assist people in dealing with drought without disaster. Success stories in combating desertification do exist, e.g., Israel's Negev Desert. But while both the technology and a plan of action (from the UN Conference on Desertification) to do this are available, what is commonly lacking is political will, especially in the face of the short-term interests of powerful elites.

7. Food and Agriculture Organization of the United Nations. AGRIS Foresty: World Catalogue of Information and Documentation Services. FAO Forestry Paper Number 15. 1979, 140 p.

DIC Catalog Number: 016.33375 F686a

This directory lists 427 institutions providing information services related to forestry and forest products in over 90 countries. The entries, written in either English, French, or Spanish, are arranged by country and contain such information as (1) the name and address of the documentation/information service; (2) identification of parent organization and source of funding; (3) subject and geographic coverage of the documentation; (4) classification systems used; (5) types of copying, quick reference services, retrospective searches, bibliographies; and (6) languages in which the documentation and information are available.

This directory is a result of a World Survey of Information and Documentation Services carried out in 1978 by FAO. It is the first step in FAO's effort to create an information network for forestry and forest products within the framework of AGRIS, the International Information System for Agricultural Sciences and Technology.

8. Food and Agriculture Organization of the United Nations. Forestry for Local Community Development. FAO Forestry Paper Number 7. 1978, 114 p.

DIC Catalog Number: 333.72 F686

This study forms one part of a program to increase the contribution of forestry in alleviating the conditions of the rural poor in developing countries. Community forestry is defined as any situation which intimately involves local people in a forestry activity. It embraces a spectrum of activities from cultivating woodlots in areas short of wood; through the growing of trees as cash crops or sources of products at the household, artisan, or small industry level; to the activities of forest dwelling communities. Information in this document is organized into three sections: (1) the nature and extent of forestry at the community level, and of the problems and the possibilities that arise; (2) policies, programs, and other requisites necessary in successfully developing community forestry activities, and (3) technical considerations (identification of need and possibilities, production and management systems, and the selection of sites, species, and techniques). The following production and management systems are discussed: multiple-product forestry, small-scale forestry (village woodlots), aboriculture, agrisilviculture, silvipasture, and integrated watershed management. All these systems share the common feature of yielding products that can either be directly consumed or easily harvested and marketed by the local communitq. Appendix 2 provides summaries of 18 forestry for community development projects. The various projects concern the production of pulpwood, gum arabic, fodder, and timber, poles, and fuelwood. Fourteen fall into the category of "small-scale," two are agrisilvicultural; one is arboricultural; and one is silvipastoral.

Other appendices include an outline of steps to be taken in surveying a potential forestry project site, examples of forestry products, notes on the taungya method of plantation production, a listing of sawmilling equipment suitable for community forestry, and an annotated bibliography, listing 100 entries (1956-1977).

9. Food and Agriculture Organization of the United Nations. Forestry for Rural Communities. 1979, 56 p.

DIC Catalog Number: 333.75 F686i

The world at large has been slow to recognize that an essential component of the rural environment — its forests and trees —is quickly disappearing. It took the ravages of drought in the Sahel and widespread erosion and floods south of the Himalayas to bring home the extent to which forests have diminished — and the price in human suffering that results. The fate of forests and woodlands is linked to that of the peoples who dwell in or near them. As populations grow, forests are felled to clear land for cultivation; branches are cut from remaining trees for fodder and fuel; and a cycle of erosion and flooding begins. In arid lands (where cattle rather than crops are the mainstay of the people), the problem is not so much an increase in human population, as it is that of animals. In many areas, livestock have increased to the point where grazing has reduced natural vegetation to mere relics of what previously existed. Tropical forests fare no better: agricultural expansion and rural settlement are regarded as synonymous with "clearing the jungle." Systems of forestry management are available to meet these crises. These include small-scale forestry (village woodlots), agrisilviculture, aboriculture, silvipasture, and multiple-product forestry. The village woodlot is little more than classical forestry scaled down to provide the local community with one main product, normally firewood. Agrisilviculture consists of the cultivation of both trees and crops, together or in rotation. Silvipasture systems involve controlled grazing of forest vegetation; and aboriculture, the intensive cultivation of trees individually, in small groups, or in orchards. Multiple-product forestry seeks to increase the yield of commodities, other than timber, that forests can provide — such as fruit, honey, game and fish, herbal medicines, and other products. However, a major barrier exists in that the strong tradition of agriculture among rural peoples is not matched by an appreciation of woodlands and forests. The promotion of forestry for community development will depend upon education, extension, and research. This document includes a listing of publications recommended for further reading (26 entries, 1971-1977).

10. Hoskins, Marilqn W. Women in Forestry for Local Community Development: A Programming Guide. Prepared under contract for the Office of Women in Development, Agency for International Development, Washington, D.C. Contract AID/otr-147-79-83. September 1979, 58 p.

DIC Catalog Number: 331.4834 H826
Publication Number: PN-AAH-678

This paper explores ways in which women in LDC's can be utilized more fully in AID programming efforts, especially in programs involving the community development approach to forestry. Until recently forestry efforts have been focused on industrial plantations and on reserve and park land management. Land use decisions were made and enforced by technicians with local residents having little or no role as decision makers or beneficiaries. Currently, however, the concept of community forestry is gaining wide-spread acceptance by development planners. This approach, emphasizing community participation, is an attempt to change the top-down structure in forestry by utilizing local residents to solve local problems. To visualize community development forestry projects that are likely to succeed in incorporating women actively, one must consider women's traditional activities in forestry. In most parts of the world, women plant fruit or shade trees in their yards. In many areas, women collect tree seeds for food or other uses. In most regions, they have an active part in raising agricultural crops. In areas where wood is the fuel, they ususally collect, transport, and store their family's supply. While many projects can be introduced to expand women's activities in forestry, these projects must be based on the technical, administrative, economic, and social information required for any community development project. Four general indicators will give program designers information concerning the potential for women's active participation in community forestry projects in a given area. These are motivation, active participation, benefit control, and administrative support. Possible projects to expand women's normal activities include the raising of seedlings in the courtyard or garden area, increasing the number of courtyard trees, planting trees in the market for shade, collecting tree seeds for sale, and improving the harvesting, transporting or storage of wood. A selected bibliography is included.

11. International Union for Conservation of Nature and Natural Resources. World Conservation Strategy: Living Resource Conservation for Sustainable Development. 1980, 1 pamphlet.

DIC Catalog Number: 333.72 I61

The World Conservation Strategy (WCS) study, commissioned by the UN Environmental Programme and financed together with the World Wildlife Fund, is intended to stimulate a more focused approach to the management of living resources and to provide policy guidance for three main groups: 1) government policy makers; 2) conservationists and others directly concerned with living resources; and 3) development practitioners, including development agencies, industry and commerce, and trade unions. The three specific objectives of the WCS are to maintain essential ecological processes and life support systems, to preserve genetic diversity, and to ensure sustainable utilization of species and ecosystems. The strategy consists of an introduction, which defines key terms, followed by three sections. The first describes the contribution of each of the objectives of conservation to human survival and well-being; outlines the main threats to them; and identifies the priority requirements for achieving the objectives. The second section sets out a strategy for action at the national and subnational levels, outlining a framework and describing each of the main obstacles to conservation and recommendations for dealing with these obstacles. The third section is devoted to international action to stimulate and support national and subnational action and includes a checklist of priority requirements, national actions, and international actions. Priority issues discussed in the strategy include, but are not limited to, the reduction in quantity and quality of agricultural and grazing land; soil erosion and watershed degradation; desertification; extinction and overexpolitation of wildlife; and inadequate environmental planning and irrational resource allocation.

12. Natural Resources Defense Council. Preliminary Guide to Audiovisual Materials on Environmental and Natural Resource Issues in Developing Countries; A Survey for the U.S. Agency for International Development/ Man and the Biosphere Program. Prepared by the International Project, Natural Resources Defense Council, Washington, D.C. 1980, 41 p.

DIC Catalog Number: 333.0141 N285
Publication Number: PN-AAJ-019

One objective of the AID/Man and the Biosphere Program is to provide technical and informational support to strengthen AID's capability in the areas of environment and natural resources in response to a 1977 congressional mandate to address environmental and natural resources problems facing developing countries. In support of this objective, the International Project of the Natural Resources Defense Council (NRDC) conducted a preliminary survey to locate films, slides, and videotapes concerning both environment and development appropriate for use in AID training programs for AID personnel and their host country counterparts on the need to maintain environmental quality and a sound natural resources base in order to sustain economic development. Results of this survey are presented in the present report. A total of 84 selected audiovisual materials are listed alphabetically by title and are identified by date, medium, length in minutes, colar/black and white, language, distributor, producer, price, availability, and content description. They are also indexed by subject matter and geographic location. A selected list of the sources of the guided materials is included.

13. Steinlin, H.J. Outline of a Global UNEP Programme. A United Nations Environment Programme Paper. March 1977, 28 p.

DIC Catalog Number: 634.9 S822

The existence or absence of trees has a decisive influence on the micro-climate: 1) their shadow reduces infrared and visible radiation at the soil surface; 2) their presence causes evaporation induced humidity which can increase dew formation; and 3) trees reduce wind speed. In addition, forests contain an extremely diversified gene resource pool, which includes other higher plants, animals, and micro-organisms as well as trees. Natural catastrophes such as climatic changes, land slides, and avalanches, wild fire, etc, account for only a small fraction of forest losses. On a worldwide scale, the need for new food producing lands and fuel is the most important in the world's major ecological zones (Boreal Forest Belt, Temperate Regions, the Mediterranean Region, Sub-Arid and Arid Lands of Sub-tropical and Tropical Climates, High Mountain Ecosystems, Humid Tropics with High Population Density, and the Humid Tropics with Low Population Density) are discussed in this report. Of these regions, the necessity for forestry programs or interventions will be most critical in the arid regions, and any sites selected for extensive land development or settlement projects. The author recommends that the UNEP undertake pilot programs in a small number of carefully chosen countries and regions. The UNEP should provide seed money and personnel, and publish and disseminate project results.

14. Taylor, J. Gary. Directory of Selected U.S. Training Programs, Short Courses and Workshops in Environmental Protection and Natural Resource Management; A Survey of Programs for the Agency for International Development and the United States Man and the Biosphere Program. Sierra Club, International Earthcare Center, New York, New York. 1979, 181 p.

DIC Catalog Number: 333.07 T243
Publication Number: PN-AAJ-021

Recent United States government mandates and a surge of worldwide concern for environmental and natural resource management have created a demand for training programs in these areas. Several United States institutions now offer training programs in various aspects of environmental protection, including forestry, agriculture, biological sciences, sociology, environmental science and engineering, ecology, agronomy, natural resource planning, urban planning, and sanitary engineering, health, and facilities design. This directory provides a selected listing and brief description of courses in these subject areas offered by United States universities, government agencies and departments, and private associations. Entries are grouped according to the type of institution offering the program. University entries are listed alphabetically by State and name of institution. Pertinent information follows, including: address; name of course, program, college or school; name of dean; degree granted; brief description of program content; admission information; types of English language training available; number of foreign students enrolled; and areas of concentration with which Man and Biosphere projects are particularly concerned. The latter include tropical and temperate forests; grazing lands; arid zones; fresh water; mountains; islands; biosphere reserves; pesticides and fertilizers; engineering works; urban ecosystems; demographic change; perception of environmental quality; and pollution. United States Government and private association training programs are listed with a brief description, respectively, of course content and participants, and of workshop, conference, or meeting content. The directory concludes with tables in matrix form ranking the institutions; programs by degree of difficulty from most difficult to noncompetitive. Production of this directory was assisted substantially by the U.S. National Committee of UNESCO's Man and Biosphere Program, which brings together diffuse national and international research, conservation, and training activities aimed at solving concrete development problems. Several college and university catalogues, computer data bases, and government agency training personnel were consulted in the preparation of this directory. Its use is intended for AID mission personnel, foreign nationals, and other concerned with balancing the conflicting needs of development and environmental preservation.

15. Wood, Dennis H. and others, The Socio-Economic Context of Fuelwood Use in Small Rural Communities. Prepared under contract by Devres, Inc. for the Bureau for Program and Policy Coordination, Agency for International Development, Washington, D.C. Contract AID/SOD/PDC-C-0187, Work Order No. 1. December 10, 1979, 293 p.

DIC Catalog Number: 662.65 D514
Publication Number: PN-AAH-747

This indepth report examines the socio-economic and environmental aspects surrounding fuelwood use in developing countries and analyzes critical issues regarding its use. Firewood and charcoal are defined as component parts of fuelwood, and discussion is given to the sources, accessibility, harvest or production, distribution, and consumption of each. These same factors are applied to the description of community fuelwood programs in general, while an annex is devoted to the discussion of specific fuelwood programs in India, South Korea, Nepal, Thailand, Nigeria, Ethiopia, Tanzania, People's Republic of China, and Colombia. For those designing and implementing individual community fuelwood programs, guidelines are provided to resolve each of the following issues confronting such projects: (1) what goals can be achieved through community fuelwood programs; (2) which types are most suited to a particular community; (3) how these programs can encourage wide, local participation; (4) what resources are required; (5) what are management requirements; and (6) what are the benefits and cost of such programs. All successful community fuelwood programs, however, take into account the importance of local participation, consideration of specific socio-economic characteristics of the proposed location and its environs, and critical examination of alternative plans and approaches. Footnotes, a bibliography, terms of reference for study, organizations and individuals contacted, and research methods are appended to the report as annexes. Additional annexes describe selected fuelwood programs, and possible future activities. Bibliographic material consists of 261 entries, dating from the 1970's with an occassional entry from 1922-1960. Topics include not only studies of global or national deforestation, afforestation, and fuelwood use, but also several dissertations on energy, agricultural economics, and social issues.

16. World Bank. Forestry: Sector Policy Paper. The World Bank, Washington, D.C. February 1978, 65 p.

DIC Catalog Number: 634.9 W927

This is a policy paper prepared for the World Bank on the relation of the forestry sector to economic development. The paper treats the general relation of forestry to development; the scope and prospects for forest development; and the role of the Bank in this development. Forests cover a third of the world's land area and over half the land area in developing countries. Forests are ecologically useful, as is evident in water catchment areas, where they regulate the influence of stream flows and prevent soil eroison and the silting of dams and canals. Forests have pronounced and beneficial microclimatic effects on humans and livestock and provide a habitat for wildlife. Forest products are used extensively in most societies for food, fuel (their principal use in developing countries, accounting for 90% of annual wood consumption), fiber building materials, and a host of industrial products. Although the forest area in developing countries exceeds 1,000 million hectares, at the present rate of consumption this stock will be depleted within 40 years. Principal causes of this situation are increases in the clearing of forests for agriculture due to population expansion and for commercial extraction of wood, especially hardwood, for industrial processing; and a neglect of counterbalancing conservation and reforestation measures. Fortunately, government and development agencies are beginning to realize the need for a forest development strategy. Basic elements of a sound strategy should include: (1) the establishment of fuelwood plantations, shelter belts, fruit, nut, and fodder trees; (2) rural forestry protection works, including reforestation of eroded catchment areas and sand dune stabilization; (3) combining trees with agricultural crops and livestock to increase production; (4) research to find appropriate combinations of vegetation for different climatic zones and soil conditions and to devise practices acceptable to local population; and (5) development of the cability of developing countries to process their resources of tropical hardwoods instead of exporting them. Those who design and evaluate forest projects should bear in mind that the effects of these projects are hard to measure and that financial returns require years or even decades. World Bank forestry lending policy is shifting from its traditional emphasis on projects furthering industrial development (e.g., pulp and paper mills) to those furthering human development (e.g., institution-building). In the future, about 60% of Bank forestry lending (which will amount to $500 million over the next five years) will be for projects in rural areas in accordance with the strategy outlined above. Specific areas to be funded by the Bank include fuelwood plantation development, policy development for log-exporting countries, and identification of key constraints to forestry development. Included in this paper are tables of the world's forests and forest resources and of consumption of forest products. An annex on special issues in forestry project appraisal is also included.

17. Zerbe, John I. and others. Forestry Activities and Deforestation Problems in Developing Countries. Prepared for the Office of Science and Technology, Bureau for Development Support, Agency for International Development, by the Forest Products Laboratory, Forest Service, U.S. Department of Agriculture. July 1980, 195 p.

DIC Catalog Number: 634.9 Z58
Publication Number: PN-AAH-919

The purpose of this report is to provide an overview of forestry activities in the developing world. A five-man team visited 17 developing countries, interviewed personnel from dozens of donor agencies, and reviewed forestry literature emanating from these countries and agencies. An inventory of current forestry projects revealed a dominance of industrial efforts — that is, the establishment of capital-intensive pulpmill or sawmill complexes rather than the management of on-the-ground forestry stands. The second largest activity was reforestation/afforestation. Still fewer donors were involved in conservation activities. The authors conclude that forestry-related problems in developing countries are far worse than on-going AID programs indicate. The authors note that forestry projects are often imposed on local residents totally from outside their communities, and as a result fail to gain their cooperation. If these projects are to succeed, the local political structure must be involved, and must feel that some of their needs are being met by that involvement. Overall, the authors recommend a balance between long-term environmental/forestry goals and immediate energy/food production needs. More coordination is needed among the various international donors and the developing country governments. AID and the other international donors should cease their studies and take action. Sufficient knowledge already exists for sound programs. The authors point out that AID hiring practices are highly centralized and bureaucratic. More forestry personnel should be hired. In addition, mission directors should be given authority to hire on the spot. A bibliography on forestry in the developing world is provided (199 entries, 1947-1980). Fifty-eight of the titles are in Spanish.

SECTION II

U.S. GOVERNMENT POLICIES AND PROGRAMS

18. Agency for International Development. A Plan of Action for AID Tropical Forestry/Deforestation/Reforestation. A memorandum prepared by Michael D. Benge, Office of Agriculture, Bureau for Development Support, and submitted to the Bureau for Program and Policy Coordination for consideration and inclusion in AID's policy statement on the use of forest resources. November 1979, 42 p.

DIC Catalog Number: 634.9 B466
Publication Number: PN-AAH-448

The causes of deforestation are multifaceted and interrelated. Immediate causes include the quest for firewood, the clearing of the land for agriculture, irresponsible logging, and ineffective land management. Root causes include land tenure patterns, inadequate agricultural prices, failure of development projects to provide for absorption of displaced labor, and poor resettlement planning. Forest protection and reforestation efforts in the less developed countries have largely failed in recent years due to LDC institutional weaknesses and the failure of project planners to recognize and address the complexity of the forestation problem. At present within AID, a variety of offices, committees, and bureaus are involved in forestation activities. No one office or bureau, however, has the predominant capability to respond to present needs, nor is there a comprehensive Agency forestation strategy. Initiatives required to remedy this situation include the establishment of an AID "Task Force" responsible for developing policy, intervention strategies, research, and projects; establishment of international forest inventories via remote sensing; and establishment of an international, integrated information system. Complementing these activities, surveys of each LDC should be conducted to determine the magnitude and causes of deforestation; technical manpower should be developed both in Washington, D.C. and in the field; associate expert training should be conducted; and increased Peace Corps involvement in forestation activities should be encouraged. In addition, assistance is required by developing country institutions in development of their forest, land, and watershed management programs. Immediate pressure on wood supplies can be reduced through the development and dissemination of improved stoves and kilns; the conservation and improved utilization of existing energy sources, such as hydroelectric power; the introduction of new technologies, especially in the area of sustained yield forest management; and the use of fuel substitutes. AID should be sure that host governments will commit themselves to the socio-economic, legislative, and administrative aspects of forestry activities. Project design should be coordinated with other donor agencies and the host government through the creation of parallel administrative units. When possible, forestry

components should be integrated into related non-forestry projects, especially in such areas as irrigation, aquaculture, and rural water. In addition, AID should develop projects that are economically sound and linked to market demand to encourage re-investment by the private sector after the termination of AID funding. Research should be directed toward the immediate problems of subsistence farmers, extension agents, and project planners. Substantive areas for further project consideration include agroforestry, reforestation using non-traditional varieties, woodlots and backyard forestry, shelterbelts and firebreaks, tree plantations, and parks and preserves. Attached are a draft memorandum proposing AID support to the International Council for Research in Agroforestry and draft Congressional presentations for two proposed AID forestry projects.

19. Agency for International Development. Appropriate Assistance in Forestry: A Message to the Field on Forestry. A memorandum prepared by Dan Deely, Office of Sciece and Technology, Bureau for Development Support. Undated, 39 p.

DIC Catalog Number: 634.9 D311
Publication Number: PN-AAH-459

Appropriate Assistance in Forestry is a message from AID's Office of Science and Technology to AID Missions and Regional Bureaus providing them with a general framework and broad directives for assistance in forestry projects. The message is occasioned in general by increased world attention on forestry issues in developing countries, and in particular by the strong mandate for forestry and natural resources projects given to AID recently by Congress in its 1977-79 Foreign Assistance Act amendments and by President Carter in his August 2, 1979 Memorandum to the Administrator. The framework for AID forestry efforts must be commensurate with the multi-sectoral dimensions of the forestry problem itself. Basic elements of a sound framework are: changes in human use of land and changes in forest and vegetation cover due to intensive human uses such as agriculture; the need for human inputs to keep forests as renewable sources of human benefit; depletion of the natural resources base through uncontrolled use and the impact of this depletion on human well-being; the use of forest resources to meet basic human needs and the value of trade-offs involved in even controlled use; the distinction between reversible and irreversible deterioration. The causes of resource deterioration are many — e.g., commercial timber harvesting, fuelwood harvesting, shifting agricultural cultivation — but adverse effects can often be minimized through sound planning. The primary cause of serious deterioration is the transformation of forest and vegetation cover by increasing human populations seeking to meet their basic needs for food, energy, and materials. Within this framework, AID forestry projects should be specifically directed towards:

(1) resources restoration and production through technology to meet critical needs; (2) forest resource and land use planning; (3) social forestry. Projects should include fuelwood plantations, reforestation within soil and water conservation, improvement of forest management at all levels, studies in institution-building and conservation development, and expanded local involvement in resource management. AID is already undertaking many such projects. Lands that are most likely candidates for reforestation work include lands that are derelict, marginal, and unintentionally degraded; lands where economic benefits outweigh benefits from agricultural alternatives; cutover lands poor in standing timber due to unsustainable commercial harvesting; lands supporting unproductive or useless vegetation cover; and lands in once-cleared catchment areas now deemed incompatible with needs for watershed water yields. A final section summarizes, with the help of illustrative tables, AID's recent involvement in forestry. Since 1975, this involvement, minimal prior to 1972, has increased dramatically, especially in Latin America and Africa, the latter through the Sahel Program with its highly recommended fuelwood component. AID has almost no agroforestry projects underway or planned through 1981. This oversight should be corrected, e.g., in initial efforts of applied research and institution building projects. AID's increasing emphasis on resource planning should be extended to the local and community levels. Social forestry, receiving the least attention at present and requiring very innovative project design, is perhaps best handled within integrated rural development projects. Regional Bureaus involved in soil and water conservation projects with forestry components should stress watershed management and reforestation in critical catchment areas.

20. Agency for International Development. Environmental and Natural Resource Management in Developing Countries: A Report to Congress, Volume I: Report. February 1979, 184 p.

DIC Catalog Number: 333.7 U58a (Volume I)
Publication Number: PN-AAG-506

The crucial question behind this report is whether the various governments of the developing world can alleviate the severe poverty of their nations, given the rapid and widespread deterioration of their natural resources. The report is based upon data from AID Missions, field experts, and a review of documentary materials, and provides an overview of problems associated with productive resources (forests, soils, water), pollution, urbanization, and environmental health for each region of the developing world -- Africa, Asia, Latin America and the Caribbean, and the Near East. Rampant population growth has led to increasingly desperate efforts to increase agricultural production -- including overly-intensive cultivation, expansion of cultivable land by clearing forest slopes and vast tracts of moist tropical forests, and overgrazing of livestock herds. Overcropping/overgrazing occurs in 80% of Africa, 80% of Asia,

37% of Latin America, and 93% of the Near East. In Africa, about 650,000 square kilometers of grazing lands have been lost to the Sahara in the last 50 years. If global deforestation continues at the present rate, at least half of the species in the genetically-rich tropics will be lost. Irrigation has also presented problems. Diversion of surface water from rivers and streams frequently causes water logging and soil salinity, and has reduced output on an estimated one-tenth to one-third of the world's irrigated croplands. Among the other issues discussed in the report are health problems (malaria, schistosomiasis, trypanosomiasis, onchoceriasis, etc.) resulting from poor sanitation and contaminated or standing water. In addition, the capability of nations in these regions to carry out programs of environmental and natural resources management are assessed in terms of government commitment, institutional structures, laws and regulations, manpower, and data-gathering and research. A 20-page bibliography and a note on contributors and methodology are included in the report. A companion volume (Volume II) consists of preliminary reports on Mauritania and Sri Lanka.

21. Agency for International Development. Environmental and Natural Resource Management in Developing Countries: A Report to Congress, Volume II: Appendix. February 1979, 129 p.

DIC Catalog Number: 333.7 U58a (Volume II)
Publication Number: PN-AAG-507

This appendix to a Report to Congress on environmental and natural resource management in developing countries contains two draft environmental reports that describe in detail the environmental features of Mauritania and Sri Lanka, including legislation and programs concerned with environment.

Located within the tropics and subject to monsoonnal winds, the Republic of Sri Lanka has two sharply different climatic zones: the set zone of of the island's southwest and the fry zone covering the remainder of its territory. In spite of such improvements as free education and health service since its independence from the British in 1948, Sri Lanka's economy has suffered from several weaknesses: (1) inability to meet food demands and rising food import costs; (2) dependence on foreign exchange for crops which in recent years have suffered price declines on the world market; (3) decline in foreign investments; (4) high levels of unemployment; (5) inflation; and (6) sharply rising prices for petroleum and other products essential for development. Drought through most of the first half of the 1970s aggravated Sri Lanka's weak economic condition, bringing about record low yields of rubber and other export crops. Sri Lanka's water, soil, and forest resources offer opportunities for development, but such development must proceed

rationally if environmental deterioration, already in evidence, is to be avoided. Although the government has established no central authority with responsibility for environmental protection, a wide range of government agencies have functions involving the environment and natural resources, and legislation providing for protection of the environment is on the books. There are also indications that government agencies, despite some ill-advised development efforts, are willing to consider factors such as the protection of wildlife and forests in laying down development plans. The major environmental problems of Sri Lanka, as touched on in this report, are, in descending order of importance: deforestation; problems involving water resources; soil erosion; dangers to coasts and coastal coral reefs; wildlife protection; and industrial pollution. The government also has problems administering and enforcing environmental legislation. The report includes a number of maps, charts, and graphs as well as a 17-item bibliography. Appended to the report are a list of animals protected under the Fauna and Flora Protection Ordinance and a list of members of national committees for the Man and the Biosphere Program.

Rapid desertification of much of its territory and the consequent loss of land devoted to both grazing and subsistence agriculture is the major environmental problem facing Mauritania. This process, severely agravated by drought affecting the entire Sahelian area of Africa, has been worsened by certain practices which have upset the balance of the area's ecology. These practices, which may to a large extent be attributed to population pressures, include: (1) the extension of agriculture to marginal lands formerly reserved for grazing; (2) the growth of livestock herds, in many cases as a direct consequence of the establishment of new watering facilities, and resulting overgrazing; and (3) deforestation resulting from foraging for firewood or land clearing for agricultural purposes. With the failure of the rains in the 1970s, marginal lands no longer produced food and, because land had been cleared of natural growth, better adapted vegetation were frequently lost to the desert. Livestock, deprived of both water and food, died in large numbers, and herdsmen, seeking to feed their animals, resorted to stripping trees for fodder, thus accelerating the process of deforestation and desertification. In Mauritania, where until recently the majority of the population consisted of nomadic herdsmen dependent on animals for food and income, the drastic depletion of animal herds also meant a loss of livelihood; this has resulted in the movement of nomadic herdsmen to crowded tent suburbs where clean water and sanitary facilities are in short supply and where disease is consequently rife. In addition to numerous maps, charts, and tables upon which the report's narrative is based, the report includes a 12-item bibliography of works useful in preparation of the report.

22. Agency for International Development. Forestry and Related Issues: An AID Discussion Paper. A discussion paper prepared by the Bureau for Program and Policy Coordination. January 1980, 50 p.

DIC Catalog Number: 333.75 A265
Publication Number: PN-AAH-449

This paper discusses the problems of deforestation and natural resource degradation, and proposes a set of policies and programs for AID to follow in addressing these problems. The first part of the paper describes the causes of deforestation and its effects. Unsustainable resource use patterns are most often initiated by fuelwood gathering, shifting cultivation, pastures and forage production, or commercial timber harvesting. Clearing land for growing food crops is the major cause of deforestation. Removal of wood for fuel (cooking and heating) accounts for 80% of all tropical wood use. The scrub and savanna grasslands which characterize the "forests" of the semi-arid tropics are severely affected by drought and overgrazing.

The second part of the paper suggests policies and programs for AID to follow in the area of forestry and natural resource management. In general, AID must use cost-effective approaches which provide for substantial participation by the people who currently use the trees — assisting them to contribute to the solutions of the problems which they now cause. Proposed assistance activities include:

(1) analysis, planning, and policy formulation (including resource inventories, land-use assessments, land capability classification, and evaluation of tenure law);

(2) institution building for natural resource management and conservation (including training, management systems, and establishment of service support institutions);

(3) incorporation of forestry activities into agricultural and rural development programs;

(4) afforestation or reforestation, and protection of natural and induced vegetation; and

(5) appropriate and alternative energy.

Specific project ideas and past experiences relevant to each proposed program area are discussed.

The final section of the paper discusses AID's strategy for the 1980's. Five major objectives are defined, each accompanied by a list of possible program initiatives. These objectives are:

(1) to raise host-government awareness of the problem of deforestation and natural resource degradation;

(2) to provide support for protection and restoration efforts;

(3) to ease pressures on current use of forests and other vegetation by developing renewable sources of energy and sustainable cropping systems for the rural poor;

(4) to increase utilization efficiency of forest and other natural resources (through improved production, extraction, and end use technologies, as well as more effective means of controlling resource utilization rates); and

(5) to strenghten host government insitutional capability to manage natural resources.

Highest priority should be placed on interventions which assist the poor in rural areas where natural resources are clearly being used in unsustainable ways. These interventions should enable the poor to implement more sustainable modes of use of land, trees, soil, and water.

23. Agency for International Development. Guidance on Forestry and Related Issues. Memorandum from Alexander Shakow and Sander Levin to the Field. December 13, 1979, 8 p.

DIC Catalog Number: 634.9 S527
Publication Number: PN-AAH-462

Outlines AID objectives with respect to the problems of deforestation and natural resource depletion. The authors also suggest a range of program options that the Missions might undertake in cooperation with LDC governments and other donors which address these problems. The objectives include: (1) raising the level of host-country awareness; (2) supporting protection and regeneration efforts; (3) reducing pressures on current use of forests and other vegetation; (4) increasing the utilization efficiency of forest and other natural resources; and (5) strenghtening the natural resources management capability of government institutions.

To raise host-government awareness, missions should consider funding activities which would help assess actual loss rates and analyze causes of deforestation. This would include resource inventories, land-use assessments, analysis of the indirect costs of deforestation, and assistance in developing a country strategy to systematically deal with deforestation and resource use problems.

Activities to accomplish the second objective might include: (1) helping to identify and protect critical watersheds and fragile environments; (2) developing planting materials and technologies; (3) training people for a variety of activities which can be locally initiated and controlled

(e.g., tree plantations, agroforestry, and woodlots); (4) developing income-generating programs for the rural poor based on managing and marketing of forest products; (5) supporting applied research in agroforestry; and (6) providing PL-480 Title II and Title III support for large-scale efforts to restore degraded lands and critical watersheds.

24. Agency for International Development. Preservation of Forests. AIDTO Circular A210 written by the Bureau for Program and Policy Coordination and distributed to all Missions. September 22, 1979, 6 p.

DIC Catalog Number: 333.75 P957
Publication Number: PN-AAH-463

In response to the rapid disappearance of forests in the humid and semi-arid tropics, President Carter issued a memorandum to the Administrator of the Agency for International Development on August 2, 1979, directing the Agency to evaluate its development assistance programs and to give priority to those which address the problems resulting from degradation of the natural resource base of developing countries and, in particular, of deforestation. The four specific objectives of the President's directive are the preservation of natural forest ecosystems; the implementation of sound forest management programs, including forest plantations and combined agriculture and forestry programs; the increased yield of family-scale tropical agriculture efforts to relieve pressures on forest lands; and the development of integrated projects for reforestation, more efficient use of firewood, and alternative energy sources. Recognizing the complex causes and multiple effects of deforestation, AID and the State Department sponsored a Conference on Tropical Deforestation in June, 1978, the results of which were distributed to all posts in January 1979. Follow-up included formation of Interagency and Non-governmental Organization working groups. The latter presented the Administrator with recommendations for increased research and development, institutional support, and incorporation of forestry topics in training programs and international meetings. AID's Africa Bureau has held conferences on the subject and provided program guidance on firewood production and cooking fuels. The Asia Bureau will convene a conference in the fall of 1979, and the Latin America and Caribbean Bureau has numerous precedential projects under way. An Agency position paper is being drafted to provide a basis for analyzing the causes of deforestation and identifying potential areas for AID intervention; and an inventory of current Agency-wide activities will be included. The examinination of specific country needs is hindered by limited and often unreliable baseline data on economic, environmental, and institutional resources. To facilitate development of environmental profiles, the Development Support Bureau contracted the Library of Congress and the University of Arizona to prepare draft environmental reports. These contain a review of existing literature on the legal, institutional, and technical aspects of the environmental problems of 25 countries. Eight profiles were completed by September 1979, for planned use in the CDSS submission process. Although no specific reforestation, production, or management

scenario is proposed, Missions are urged to stress the subject of forestation in discussions with host governments. The development of close ties between Missions and Peace Corps staff is urged. Missions are also asked to report the funding and personnel implications of increased forestation efforts to the DSB resources/needs evaluation group. Attached are the Presidential Memorandum of August 2, 1979; Congressional Report HR 96-273 (exerpted); a list of new Indefinite Quantity Contractors with expertise in environmental and natural resources assessment; and Panama telegram 05948, detailing that Mission's forestry-related activities.

25. Agency for International Development and Peace Corps. Memorandum for the President in Response to Presidential Directive of August 2, 1979. Joint memorandum of Richard F. Celeste, Director of the Peace Corps, and Douglas J. Bennet, Jr., Administrator of the Agency for International Development, in response to the Presidential Directive of August 2, 1979 which directs AID and the Peace Corps to evaluate their developmental programs against the specific objectives that promote an improved natural resource base in developing countries. September 19, 1979, 4 p.

DIC Catalog Number: 634.9 P355a

On August 2, 1979, President Carter directed the Agency for International Development and the Peace Corps to evaluate and assign high priority to development assistance programs which improve the natural resource base of developing countries and, in particular, forest resources. In a September 19, 1979 memorandum responding to the President's directive, the Administrator of AID and the Director of the Peace Corps address specifically the increasingly serious problems of deforestation and environmental degradation while improving already degraded areas. General reference is made to forestry, agroforestry, and reforestation activities under way in 40 countries around the world; specific projects in Peru, Chad, and the Sahel are also cited. A watershed management project in Panama, conservation and environmental protection measures underway in Bolivia and El Salvador, and a natural resource project in Costa Rica are mentioned. Village woodlots, alternative fuels, and land reclamation activities are being carried out in Africa, Asia, and the Near East while cooperative efforts on woodlots and other firewood production sources have been initiated. A workshop conducted by AID focusing on energy, forestry, and environmental priorities in Asian countries and a major initiative by Peace Corps to identify appropriate solutions to world foresty problems will contribute to the natural resource conservation and alternative energy development activities of the two agencies. Finally, Peace Corps has implemented a comprehensive energy use evaluation and alternative energy development project funded by AID which will identify alternative energy sources and conservation techniques for third world populations. Attached to the memorandum is a note dated August 10, 1979 to the Administrator of AID from an assistant administrator suggesting a course of action in responding to the President's Environmental Message on Reforestation.

26. Council on Environmental Quality and the U.S. Department of State. "Forestry Projects." In The Global 2000 Report to the President: Entering the Twenty-First Century, Volume II: The Technical Report. Published by the Superindentent of Documents, U.S. Government Printing Office (GPO), Washington, D.C. GPO Publication Number SN/041-011-00038-6. 1980, pages 117-136.

DIC Catalog Number: 330.9 B26la (Volume II)

This report, prepared by the Council on Environmental Quality and the Department of State in response to a presidential directive, is the first U.S. Government effort to examine trends in population, natural resources, and the environment, as well as the interrelationships among all three issues, from a long-term global prespective. The report, which utilized the data and models routinely employed by Federal agencies to develop trend projections, contains tabular data and textual projections on the areas mentioned above and is reported in three volumes. This technical report is the second volume. Volume I is the summary. Volume III contains technical documentation on the Government's global models. Chapter Eight of the present report treats forest inventories, the global economic significance of forests, forestry trends and projections by geogrpahic region, the special problem of the tropical moist forests, and global scenarios. By the year 2000, forests will have been reduced to one sixth of the world's land surface. Deforestation will continue as the demand for forest products and fuelwood increases. Rising prices and scarcity of wood products may be disruptive to industrialized nations but no catastrophic changes are foreseen. In LDC's, however, drastic changes will occur. Erosion, flooding, and other deforestation problems will severely affect LDC food production while rising wood prices and product scarcity will put fuelwood and charcoal out of economic reach. The loss of tropical moist forests will be especially disastrous since they cover larger areas than other forests, have less recovery potential, and are genetically and ecologically richer resource systems. Forestry changes will have other global environmental and economic impacts such as plant and animal extinction, tropical fruit scarcity, altered forest product trade, and climatic changes. These projections provide an awareness of probable trends and should induce worldwide forestry policy changes to minimize these problems before they become catastropic. A reference list is appended.

27. Council on Environmental Quality and the U.S. Department of State. The Global 2000 Report to the President: Entering the Twenty-First Century, Volume I: The Summary Report. Published by the U.S. Superintendent of Documents, U.S. Government Printing Office (GPO), Washington, D.C. GPO Publication S/N 041-011-00037-8. 1980, 47.

DIC Catalog Number: 330.9 B261 (Volume I)

This report, prepared by the Council on Environmental Quality and the Department of State, in response to a presidential directive, is the first U.S. Government effort to examine trends in population, natural resources, and the environment, as well as the interrelationships among all three issues, from a long-term global prespective. The study will serve as the Government's foundation for long-range planning. The Global 2000 Study utilized the long-term global data and models routinely employed by the Federal agencies in order to develop trend projections. The report contains tabular data and textual projections concerning population, resources, and their environmental impacts. Population, resources, and environmental stresses are foreseen. Predictions for the year 2000 reveal a world which is more crowded, more polluted, less ecologically stable, and more vulnerable to disruption than our current one. Rapid world population growth will continue. Food consumption in LDC's will scarcely rise while food prices will double. Hunger, disease, and infant mortality rates will increase. As soils deteriorate worldwide, arable land will increase by only four persent. While rich industrialized nations command enough oil to meet rising demands, LDC's will have difficulty meeting energy needs. The world's fuel resources will continue to be unevenly distributed, and further discoveries and investments will be needed to maintain nonfuel mineral resource reserves. Regional water shortages will become more severe and losses of world forests will continue as demand for forest products and fuelwood increases. Hazardous atmospheric chemicals will increase and alter the world's climate. Extinctions of plant and animal species will increase dramatically. These projections provide an awareness of probable trends and may induce worldwide public policy changes to minimize these problems before they become unmanageable. The study is reported in three volumes. This summary is the first volume. Volume II is the technical report. Volume III contains technical documentation on the Government's global models. A comparison of the Global 2000 study with other global studies, and a reference list are appended.

28. Freeman, Peter H. Forestry in Development Assitance: Background Paper for AID Policy and Programs. Report prepared for the Office of Science and Technology, Development Support Bureau, Agency for International Development. September 1979, 77 p.

DIC Catalog Number: 634.9 F855
Publication Number: PN-AAH-465

This background paper discusses technical and related socio-economic concerns that should be considered in formulating AID programs concerned with forestry and deforestation. The principal causes of deforestation are identified as the increased international demand for tropical hardwoods and the growing LDC demand for hardwoods and softwoods; the rapid increase in the human and ruminant livestock population; insufficient land, vegetation, or water (or access to these) under traditional systems of use; and insufficient development. Deforestation results in desertification and degradation of soils, and erosion of watersheds, and can be combatted through six basic intervention strategies: (1) Large-scale forestation in LDC's, i.e., the establishment of large plantations on government-owned or subsidized land, is viewed as the only way to meet future wood needs on a predictable and sustainable basis after the year 2000, even in regions that now have abundant forests. Although AID lacks experience in largescale forestation, a considerable body of international literature exists, and the economics of plantation silvaculture are easily adaptable to conventional project analysis. Small-scale forestation, i.e., trees grown in small stands as crops by individuals or communities has been carried out successfully only in the People's Republic of China, South Korea, and the Gujarat province of India. In addition to a strong community commitment, small-scale forestation requires that the trees not compete with necessary food or cash crops. Constraints include traditional attitudes, questions of land tenure, and the lack of immediate benefits. (2) Traditional forest management in LDC's has stressed the exploitation and marketing of forest products rather than long-term management after cutting. Improved utilization and processing of products, however, can slow the rate of forest depletion while improving product yield. (3) Agroforestry, the simultaneous or sequential growing of trees with agricultural crops, can be combined with good management practices to replant depleted forests. Under this system, shifting cultivators (slash and burn farmers) replant seedlings in cut areas in exchange for land use rights until the tree canopy closes. Recently, however, agroforestry emphasis has included the enrichment of land for agricultural use through the planting of nutrient-cycling species. (4) Semi-arid Zone Vegetation Management, to combat the further degradation of the fragile Sahel area, requires the integration of range management, soil management, education, and ground cover rehabilitation efforts. (5) Park and Wildland Management, especially of the humid tropical forest areas, provides sustained access to a live model of the ecosystem that will be most affected by deforestation between 1980 and 2000. (6) Institution building is a necessary adjunct

to any of the foregoing interventions; it must entail educational programs and the enhancement of LDC institutions, development of country and regional environmental profiles, research, and technical assistance. Recommended AID program goals relevant to these interventions include support of rural self-sufficiency in firewood; woodfuel plantations for urban consumption; national or regional vegetation management for the Sahel and other fragile semi-arid zones; increased agroforestry activity in LDC's; more efficient processing of tropical products; and increased tropical ecosystem research. Project identification in developed areas should stress management of existing vegetation, restoration of watershed areas, and establishment of trees with multiple benefits (fuel, shade, food, nutrient cycling). Projects in agricultural frontiers and wildlands should stress preservation coupled with carefully planned and managed forest exploitation. AID support for overall vegetation management in semi-arid areas should include surveys of vegetation resources, varietal research, and preparation of overall management strategies.

29. Natural Resources Defence Council, Inc. Aiding the Environment - A Study of the Environmental Policies, Procedures and Performance of the U.S. Agency for International Development: Recommendations. Natural Resources Defence Council, Inc., Washington, D.C. February 1980, 11 p.

DIC Catalog Number: 333.7 B636
Publication Number: PN-AAH-452

AID has made significant progress during the last five years in the environmental and natural resources area. However, from its study of AID's environmental policies, procedures, and practices, the Natural Resources Defense Council (NRDC) has outlined a set of recommendations which would further strengthen AID's program. First, AID must accelerate assessment of environmental and natural resources problems in each of its recipient countries. A new Office of Environment and Natural Resources should be established within the Development Support Bureau, to consist of present DSB staff and a soil conservation specialist Other staffing should include four full-time environmental officers in Washington and nine in the field. Closer oversight is needed for environmentally-sensitive projects; such as dams, roads, irrigation, and new lands development. Environmental project design criteria should be developed for malaria control, housing, small-scale irrigation, rural electrification, rural water supply, and small-scale industry. Other areas requiring greater emphasis include research in support of sustainable development and resource management, soil conservation, energy, and pest management. AID in-house training should be stepped up and environmental/resource seminars should be organized annually. AID's existing computer systems could be used to establish a central record of environmental and natural resources projects and to provide summaries of lessons learned from these projects to personnel in AID and other development agencies. In addition, AID should tighten procedures in selecting environmental contractors, and should urge other development organizations to commit themselves to environmental programs. NRDC prepared this report for the International Institute for Environment and Development as part of a larger project to evaluate the environmental programs of international donor agencies in Canada, the Federal Republic of Germany, the Netherlands, Sweden, the United Kingdom, and the United States.

30. Peace Corps. Peace Corps Forestry Initiative. Paper prepared by Carol Ulinski and John Earhart, Office of Programming and Training Coordination, Peace Corps. October 1979, 46 p.

DIC Catalog Number: 634.9 P355
Publication Number: PN-AAH-458

This Peace Corps forestry initiative paper addresses the problem of deforestation. It describes the U.S. response to deforestation; resource needs and collaborative possibilities with other development organizations to implement such projects, and a general timeframe for implementing the proposed global Peace Corps forestry program. As demands for cultivable land, timber, and fuel rise; deforestation, which implies consequent loss of fuelwood and soil fertility and desertification in some areas, is occuring at an annual rate of 18 to 20 million hectares. The World Bank estimates that 20 to 25 million hectares must be reforested before the end of the century, but current rates of planting indicate that only 2 million hectares will be reforested. Obstacles to reforestation programs include failure to plant or maintain vegetation, disregard of indigenous flora as renewable resources, failure to account for the disparity between the amount of labor and resources required and realization of results, and lack of host country commitment. The high priority that the United States accords reforestation efforts is shown by Presidential, Congressional, and Department of State responses. The President issued a memorandum to the Director of the Agency for International Development (AID) to review current efforts to preserve and manage the world's forest resources and to develop programs in conservation and alternate energy sources. Congress added a provision to the Foreign Assistance Act authorizing the President "to provide assistance for...agroforestation, reforestation and forest management" projects. A recent Conference on Tropical Deforestation, co-sponsored by AID and the Department of State, recommends establishing a task force to draft a U.S. policy and strategy statement concerning deforestation. With experience in 40 countries, Peace Corps proposes their continued support of small-scale, experimental, and eventually replicable activities to reverse the trend of deforestation. To this end, a range of possible forestry projects is sketched which describe six production-oriented projects and one conservation-oriented program. Village woodlot activities would provide a local source of fuelwood by planting and maintaining indigenous tree species while relieving pressures on national forests. Reforestation activities can control erosion through planting trees and terracing contour water ditches, while providing a source of wood for future consumption. Agroforestry is a land management system which combines livestock or crop production with growing trees. Projects of this type increase food productivity, rehabilitate soil resources, and ensure a wood supply. Land rehabilitation activities, including employment of revegetation, reforestation and terracing techniques, attempt to stop soil erosion before it occurs or improve already damaged land. Vegetation resource management projects in arid zones involve the construction of windbreaks or shelterbelts to prevent desertification. Forest resource management projects bring publicly owned land to its full production

potential by employing systematic cutting, land use-planning, and watershed management practices. Improvement of domestic technology in developing more efficient use of energy is the main thrust of wood conservation projects (e.g. stoves and charcoal kilns). Countries in which these projects are being conducted successfully include Chad, Niger, Upper Volta, Nepal, Guatemala, Honduras, and Paraguay. Although the project designs will be affected by different cultural, physical, and social environments depending on location, each project shares common goals, problems, basic skill requirements, and implementation difficulties. Each project addresses the problem of environmental degradation and strives to heighten local awareness of the importance of resource conservation. Personnel must be competent in development techniques and familiar with local languages and customs. Some obstacles to successful project implementation are scarcities of land, water and labor, and a lack of local tradition in cultivating trees. Resources required to implement these projects are discussed including materials support, personnel training, technical asistance, evaluation and development education.

31. Proceedings of the U.S. Strategy Conference on Tropical Deforestation. Conference was convened by the U.S. Department of State and the U.S. Agency for International Development in Washington, D.C., June 12-14, 1978. October 1978, 84 p.

DIC Catalog Number: 634.9 U58
Publication Number: PN-AAG-132

Reflects the major conclusions, recommendations, points of view, and formal statements of the U.S. Strategy Conference on Tropical Deforestation that convened in Washington, D.C., June 12-14, 1978. Finds world confronted by an extremely serious problem in the accelerating loss of forest and vegetative cover in the humid and semiarid lands within or near tropical latitudes. Suggests accelerated and coordinated attack if these greatly undervalued and probably irreplaceable resources are to be protected from virtual destruction by the early part of the next century. Cites as a major cause of deforestation the lack of information and documentation concerning the importance of these resources. Suggests population growth and need for firewood as additional key factors. Points to need for appropirate monitoring and assessing systems; improving basic physical, chemical, biological, and ecological processes; and developing alternatives to present forest use as deterrants for further destruction of forests. Includes a list of participants and offers sections on presentations, workshops, and "reactions and next steps."

32. U.S. Interagency Task Force on Tropical Forests. The World's Tropical Forests: A Policy, Strategy, and Program for the United States: A Report to the President. U.S. Department of State Publication Number 9117. May 1980, 53 p.

DIC Catalog Number: 333.75 D419
Publication Number: PN-AAH-748

Examines the growing problem of deforestation in tropical lands and suggests a United States strategy to help alleviate the problem. Report is by a U.S. Interagency Task Force and is in response to President Carter's Environmental Message of August 2, 1979.

The report is in three parts. First, the world's forest resources are surveyed, as well as the causes, rates, and consequences of deforestation (loss of forest cover). Next, national and international technological and institutional capabilities to meet the deforestation problem are outlined; followed by an analysis of the U.S. stake in tropical forests, and recommendations for a U.S. forest policy and a strategy to achieve it.

The report confirms the widely held view that the world's tropical forests are in jeopardy and that serious social, economic, and environmental costs are being incurred, especially by the rural poor in developing tropical countries. The report also indicates that the U.S. has a vital stake in preserving both its own and other tropical forests and that, together with other nations and international organizations, it can help to alleviate the deforestation problem.

Several important perspectives emerged in the course of the study. (1) Wood harvesting for in-country uses and large-scale conversion of forest land to other, mainly agricultural, uses are by far the principal sources of tropical forest loss. (2) Despite their substantiality, U.S. imports of tropical hardwoods account for an insignificant percentage of total hard and soft woods used in this country. (3) Legitimate reasons for tree removal and forest land conversion exist. What is needed is expansion of the long-and-short-term benefits of tropical forests through improved management. This includes both their management as a renewable timber resource under the principle of sustained yield, and the maintenance of other values (ecological, recreational, scientific, educational, etc.) that will be increasingly important in the future. (4) The future of tropical forests will be determined largely by decisions of governments on seemingly unrelated issues, e.g., food production, energy, and land use. Efforts must be made to address the effect

of these influences on tropical forests, while concurrently providing a new policy focus and program policy for tropical forests.

SECTION III

TECHNICAL AND GEOGRAPHICAL REPORTS

33. Adeyoju, S. Kolade. Forestry Administration Problems in Selected African Countries: A Study on Forest Administration Problems in Six African Countries (Cameroon, Ghana, Kenya, Liberia, Nigeria, and Tanzania). Food and Agriculture Organization of the United Nations, Rome, Italy. Report FO: MISC/76/21. November 1976, 60 p.

DIC Catalog Number: AFR 350.823 A233

This study is an historical and analytical survey of the national forest services of Cameroon, Ghana, Kenya, Liberia, Nigeria, and Tanzania, and their capabilities as active resource management agencies. Initial attention is focused on the evolutionary stages of the development of forest services, from colonial rule to independence. Various factors affecting the nature and purpose of public forest administrations in the aforementioned countries are then described. Thereafter, the resources at the disposal of the forest services are analyzed, and the effects of political and social changes on the supply of much needed resources and on the growth of forest administrations examined. The last sections of the study discuss the major problems and feasible ways and means of improving the institutional strength of forest services. Two basic questions are raised: what are the fundamental difficulties and shortcomings of forest services; and what potentials do forest services possess for improving their performance? While no simple answers to these questions are forthcoming, the following general observations are made. With the transition from colonial rule to independence, attention shifted from conserving forest resources (especially timber) to using them innovatively to attain national development goals. This shift, however, was not accompanied by a recognition of the institutional importance of forest services nor by the upgrading of the latter. As a result, there is no systemmatic planning and management for forestry, and the dearth of forest management expertise is striking. A radical reorganization of forest services is needed. While no structural model for this exists, the following structural elements should be included: that forest services be accorded the status of a ministry, through one that is separate, autonomous, and operated like a business-oriented corporation; and that they have access to development funds. The most critical need of all, however, is for the development of a truly professional attitude. A bibliography containing 51 entries (1919, and 1945-1975) is appended, as are tables of the ministerial organization of forest services, important units within forest services, and grades and minimum training requirements of forest service personnel.

34. Agency for International Development. The Firewood Problem in Africa: Report on the Firewood Conference and Request for Field Views. AIDTO Circular 364 prepared by the Special Development Problems Division, Office of Development Resources, Bureau for Africa, and circulated to African Missions. August 29, 1978, 52 p.

DIC Catalog Number: AFR 662.65 D491
Publication Number: PN-AAH-765

This memorandum to Mission Directors from the Bureau for Africa, reports on the Africa Firewood Conference held in June 1978. Participating in this workshop were representatives from AID, the World Bank, Africare, the Departments of Energy and Agriculture, the National Academy of Sciences, VITA, al Dir'Iyyah Institute, the Overseas Development Council, and several universities and consulting groups. The participants concluded that firewood and charcoal are becoming scarce and expensive in Africa due to deforestation caused by cultivation, urbanization, wood collection, livestock grazing, and drought. Participants found, however, that there is a general lack of knowledge of the extent of firewood depletion in the various Sahel areas. As a result, it is difficult to plan effective projects or formulate rational policies. Therefore, the participants strongly endorsed a project-oriented study to be conducted in six countries, which will be selected on basis of strong AID Mission and host government interest. This proposed study will evaluate the actual dimensions and nature of the crisis and will assist in designating specific countries where firewood projects will be implemented. According to the scope of work (Attachment C), to be performed by a single contractor, the following assessments will be made in each country: the specific areas of deforestation and greatest climatic potential for growing trees; appropriate tree species for projects in the Sahel; local and governmental perception of the need for firewood projects; methods of firewood collection, types of firewood and their costs; patterns of firewood usage; availability of local institutions to manage firewood projects; and present efficiencies of wood use, given current methods of cooking and charcoal manufacturing. Past and present firewood experience will be researched concurrently with country studies. Based on lessons drawn from this research, guidelines will be formulated for implementing effective firewood projects. Results of each country review will be discussed with relevant government agencies and concrete AID projects will be proposed for AID/W review and approval. In some locations immediate action should be taken, rather than waiting for the completion of a full-scale review. Workshop participants agreed that testing wood stoves for efficiency, conducting pilot woodlot experiments in villages, or establishing firewood plantations near urban areas are activities which can be initiated in areas requiring immediate assistance. In the memorandum, the Mission Directors are requested to: (1) review the workshop summary and discuss their findings with host country agencies; (2) provide comments pertaining to the perception of the problem; (3) indicate activities which the mission will undertake, such as inclusion of firewood components in current projects, or participation in

the firewood study; and (4) comment specifically on the scope and methodology of the proposed firewood study. A full list of conference participants, summary of workshop proceedings, scope of work for the firewood study, and a discussion paper for the workshop are included in the memorandum as attachments.

35. Budowski, Gerardo. National, Bilateral and Multilateral Agroforestry Projects in Central and South America. A paper delivered at the International Conference on International Cooperation in Agroforestry, July 15-23, 1979, Nairobi, Kenya by Gerardo Budowski, Head, Natural Renewable Resources Program, Centro Agronomico Tropical de Investigacion y Ensenanza (CATIE), Turrialba, Costa Rica. 30 p.

DIC Catalog Number: LAT 634.9 B927
Publication Number: PN-AAH-941

This paper describes current agroforestry programs in Central and South America, and makes recommendations for future agroforestry interventions. Agroforestry is defined to include agrisilviculture (including the taungya system), multiple strata management, sequential cropping, management of secondary forests following abandonment of cultivation or pastures, certain types of shelterbelts, live fence posts, trees grown for soil improvement, fodder trees, and trees bordering ponds. Most of the information in this paper related to wet rather than dryland areas. A country-specific history of agroforestry systems and techniques recently used in Central and South America is presented, emphasizing CATIE's work in Costa Rica. Following that section, a number of recommendations are presented with regard to the implementation of both country-specific forestry projects and cooperative efforts involving all the developing nations. First priority should be given to the incorporation of traditional agroforestry techniques (those already being used by local farmers and communities) into future forestry projects. Distinct ecological regions should be established, and experimental trials and pilot projects should be carried out before implementing any major intervention intended to benefit rural populations. Production of fish and domestic and wild animals should be considered as possible project components in many areas. Future efforts should also include information and communication networking, education and training, and dissemination of germplasm. In addition, a research and promotion network should be established to bring together national, regional, and international organizations working in the field of agroforestry. A bibliography is provided (69 entries, 1960-1979). Most of the entries are in Spanish.

36. Clark University. Fuelwood and Energy in Eastern Africa: An Assessment of the Environmental Impact of Energy Users. Report prepared for the Agency for International Development, Washington, D.C. by the Eastern Africa Environmental Trends Project, Program for International Development, Clark University, Worcester, Massachusetts. Contract No. AID/afr-G-1356, August 1978, 153 p.

DIC Catalog Number: AFR 634.98 C595
Publication Number: PN-AAH-464

This report has three major purposes: (1) to assess the current and potential energy situation in East Africa (Zambia, Kenya, Sudan, Tanzania, and Ethiopia) including East Africa's relationship to the global energy situation; (2) to detail the use of fuelwood (firewood and charcoal) as the primary energy source for the region; and (3) to describe the factors involved in securing an energy future for East Africa, and to offer recommendations for feasible fuelwood development strategies. The report stresses that, under existing circumstances, East Africa's energy future is indeed bleak. A rapidly increasing regional population plus the ever-increasing energy demands of developing national economies combine to result in an energy consumption growth rate higher than that for the developed world. Yet, indigenous, economically-exploitable energy resources in the region are minimal. Fossil fuels, oil and coal, the primary energy sources for the rest of the world and this region as well, must be imported. Given the escalating prices of fossil fuels and the depressed economic status of the region, fuelwood remains the primary, and only feasible, energy source for East Africa's rural and urban poor. Until recently, firewood was, in fact, a viable energy source. However, the continuous collection of firewood has resulted in the deforestation and consequent progressive desertification of the region. Villagers must travel increasing distances for firewood and thus devote an increasing amount of their productive time to this activity. Accordingly, small firewood collection and distribution enterprises have evolved. Also, as forests retreat further from populated areas, manufacture and use of charcoal (a substance which is easier to transport over long distances than firewood, but whose production consumes forests as an even faster rate than collection of firewood), is increasing. Several impediments to the execution of an effective regional reforestation/fuelwood program do exist, however. As present fuelwood prices are artificially deflated (due to the availability of "free" firewood), investments in an operation of reforestation/fuelwood enterprises are discouraged. Also, developing a regenerating fuelwood forest demands a long-term commitment. Several years must pass before there is any return on invested monies or effort. Peasants fear that with the present trend toward private land acquisition and ownership, the land they hold by traditional

customary tenure might be purchased and owned by someone else later. These peasants cannot afford to buy the land, and are reluctant to plan and cultivate trees that will perhaps be harvested by someone else at maturity. Furthermore, as the fuelwood needs of the rural and urban poor are immediate, it would be difficult to convince these peoples to devote time needed for present firewood collection to cultivating a future (minimum eight years hence) firewood resource. This report recommends small community forestation projects as the most viable approach toward solving fuelwood needs. Implementing successful projects, however, will demand: (1) long-term commitment by regional governments and donor agencies in reforestation activities; (2) enactment of governmental legislation ensuring sustained community ownership over the forest lands they cultivate; (3) careful investigation and determination (by production systems and land capability surveys) of sites and tree species suitable for forestation projects; (4) inclusion of the communities, themselves, in the planning of such projects — not only for the purpose of gaining information necessary for site selection, but also to educate community members in the technologies and benefits of reforestation. This report includes nine substantive appendices covering: Energy Use in East Africa; Electricity in East Africa; Forest Cover and Vegetation Succession in East Africa; Alternative Energy Technologies; Appropriate Energy Technologies; Determination of Economic Optimum of Forestry Projects; Factors Influencing Species Choice; Forestry Case Studies; and an East African Energetics System.

37. Esman, Milton J. and others. Landlessness and Nearlandlessness in Developing Countries. Prepared for the Office of Rural Development, Bureau for Development Support, Agency for International Development, by the Rural Development Committee, Center for International Studies, Cornell University, Ithaca, New York. August 25, 1978, 63 p.

DIC Catalog Number: 338.1 E76
Publication Number: PN-AAG-727

An exploratory review of the literature on the "landless and nearlandless" (i.e., the rural poor) in the developing countries of Asia, Africa, and Latin America. Central to the author's conclusions are that the majority of rural households consist of landless workers or marginal cultivators whose holdings are too small or too poor in quality to permit even subsistence farming; and that any serious attempt to alleviate rural poverty in LDC's must reach these workers. The three major categories of a detailed classification scheme of the highly diverse "landless and nearlandless" are laborers and workers, cultivators, and pastoralists and nomads. The author also classifies countries and their rural areas into four major types according to population density and land tenure relationships. The first type combines heavy population pressure on arable land with privately owned and operated holdings of moderate size (seldom exceeding ten hectares of irrigated and twenty-five hectares of unirrigated land). A second type is characterized by very large holdings on more fertile lands operated by landlord families or commercial firms which economically and politically dominate the rural areas. In the third type of area, a gross sufficiency of land meets immediate demands, but with very low productivity per acre or per unit of labor because of weak soils, inadequate technologies, poor infrastructure, low rainfall, and insufficient production inputs. The fourth type of areas are pastoral societies usually organized on a tribal or extended kinship basis. The sources, trends, and the dynamic factors that account for and contribute to landlessness are also summarized. The conditions which the landless live are discussed, as well as policy and program measures undertaken by governments to alleviate such conditions. Under each policy category, action measures are suggested which international development agencies might consider, relating them where possible to specific target groups. Comments are povided on available published information on the landless, and suggestions for research priorities to which international agencies, governments, and scholars might address their attentions. The appendix is a preliminary effort to disaggregate the landless and near-landless into more precise and discrete categories to facilitate future research and program intervention. The overall picture that emerges for most of the countries surveyed provides little ground for optimism. The insecurity, indebtedness, and powerlessness of the landless poor seem to be worsening in all but a few countries. Many public policy measures that affect rural areas have been detrimental to the landless and near-landless; even those measures specifically designed to alleviate their poverty have often proved to be of only marginal help. There are no simple solutions. Any strategies must take into account the structures of social and economic power that now govern the distribution of assets, income, job opportunities, and public services.

38. Food and Agriculture Organization of the United Nations. China: Forestry Support for Agriculture. Report on a FAO/UNDP Study Tour to the People's Republic of China, August 11 - September 30, 1977. FAO Forestry Paper No. 12. 1978, 103 p.

DIC Catalog Number: CH 333.75 F686

Reports on a FAO tour of the People's Republic of China to discover how forestry supports agriculture in China. An introductory chapter sketches the soil and forest conditions in the five provinces visited (Liaoning, Honan, Hupeh, Hunan, and Kwangtung) and describes the massive afforestation and forest improvement program begun after 1949 -- precisely for agricultural purposes. Succeeding chapters outline the organizational structure of the agricultural sector in China, together with forestry education, research, and extension; and forestry policies, planning procedures, and implementation.

Forestry in China serves the predominantly agricultural Chinese economy, which is focused on grain production. Through a replenishing of forest stocks, China has attempted to create a land and water environment favorable to agriculture while at the same time ensuring a steady stream of income for its collective economy and for procurement of capital goods to bring about technological advancement. Forestry development has utilized the labor of large masses of people, who are organized into communes and production brigades whose guiding principle is self-reliance.

Major elements of forestry support for agriculture are "four-around" or "four-sides" plantation (planting along roads, along rivers or canals, around houses, and around villages); shelterbelts; sand-dune stabilization; coastal windbreaks; watershed management; afforestation of bare mountains; plantation of fast-growing tree species for timber production; and forestry for food and non-wood products. Each of the above elements is analyzed in technical detail.

Brief concluding chapters treat the possible adaptation of Chinese forest practices in other countries and provide recommendations for multilateral and bilateral follow-up projects.

39. Food and Agriculture Organization of the United Nations. Establishment Techniques for Forest Plantations. FAO Forestry Paper Number 8. 1978, 183 p.

DIC Catalog Number: 634.956 F686b

This reference book documents the principal methods of establishing forest plantations. While coverage is global, techniques suitable for tropical and sub-tropical regions are emphasized. The plantation establishment phase is considered to be that general period from initial site preparation to the stage when the plantation crop closes canopy. The book therefore covers site preparation, planting and direct sowing, early tending and protection operations, as well as the necessary operational planning measures required to ensure timely and efficient completion of activities. These areas are considered broadly, covering the main techniques and general principles of plantation establishment and operational planning. For greater detail on specific practices for particular areas, the authors suggest consulting other manuals or handbooks prepared for individual regions. Many of these publications are listed at the end of each chapter. An additional bibliography of general comprehensive information sources is listed at the end of the book.

40. Food and Agriculture Organization of the United Nations. Shifting Cultivation and Soil Conservation in Africa. Papers presented at the FAO/SIDA/ARCN Regional Seminar on Shifting Cultivation and Soil Conservation in Africa, Ibadan, Nigeria, July 2-21 1973. FAO Soils Bulletin No. 24. 1974, 248 p.

DIC Card Catalog Number: AFR 631.4 F686

This document consists of 24 papers presented at the Seminar on Shifting Cultivation and Soil Conservation in Africa held in Ibadan, Nigeria in 1973. The seminar, and the papers presented there, focused on the problems posed by shifting cultivation in terms of soil conservation, erosion, and limited productivity. Although approximately 30% of the world's exploitable soils have been placed under shifting cultivation, its adequacy is increasingly questioned. The years the land must be left follow, combined with the later high labor input in clearing it, greatly reduce the level of productivity which can be reached under this system. In addition, population pressures frequently result in the extension of cropping periods. Shifting cultivation and the effects and efficient use of fertilizers, pesticides, weed-killers, and seeds are discussed. Bibliographic references accompany most of the papers.

41. Freeman, Peter H. and others. Bolivia: State of the Environment and Natural Resources: A Field Study. Prepared under contract by JRB Associates, Inc. for the Office of Development Resources, Bureau for Latin America and Caribbean, U.S. Agency for International Development. July 1980, 105 p.

DIC Catalog Number: BL 333.7 F855
Publication Number: PN-AAH-980

Freeman, Peter H. and others. Bolivia State of the Environment and Natural Resources: A Field Study Executive Summary. Prepared under contract by JRB Associates, Inc. for the Office of Development Resources, Bureau for Latin America and Caribbean, U.S. Agency for International Development. July 1980, 14 p.

DIC Catalog Number: BL 333.7 F855a
Publication Number: PN-AAH-981

In fall 1979, AID contracted a multidisiciplinary team of seven environmental and renewable natural resource experts to undertake a broad study in Bolivia of the following topics: wildlands and wildlife, natural forests, plantation forests, soil erosion and watershed management, high altitude range management and conditions, and industrial and urban pollution. Individual reports were compiled and edited into the present report, the purpose of which is to orient future efforts by AID, the Government of Bolivia, and the international assistance community in environmental and natural resources work. One chapter is donated to each of the above mentioned topics. A brief introduction and a concluding chapter on Bolivian environmental and natural resource institutions round out the main body of the text. Prefacing this text is an excutive summary which has been published separately. The most serious problems affecting Bolivia's renewable natural resources are soil eroison; range degradation; illegal settlement, hunting, and lodging; and the deforestation and destruction of woody vegetation. Water pollution by human wastes and by industry and pesticides are the major health problem areas. The principal constraints to solving Bolivia's environmental and pollution problems are the weakness of the Centro de Desarrollo Forestal, the lack of official perception of soil erosion and range degradation, the lack of regulations for the 1978 Health Code and of a wider context for pollution control, and misconceived development strategies. Recommmendations are made in each of these areas as well as in such general areas as comprehensive planning for environmental conservation, non-governmental groups in conservation and pollution control, appropriate technology and natural resources conservation, and the integration of natural resources conservation and community development. Finally, a set of ten recommendations to AID relating to institution building and direct assistance in Bolivian environmental and natural resource projects is included. Appended to the report are list of acronyms and persons interviewed and an 80-item bibliography (1958-1979).

42. Hoskins, Marilyn W. Community Participation in African Fuelwood Production, Transformation, and Utilization. Discussion Paper prepared for Workshop on Fuelwood and Other Renewable Fuels in Africa, Paris, November 29-30, 1979. 75 p.

DIC Catalog Number: AFR 634.98 H826
Publication Number: PN-AAH-466

The major source of fuel for cooking and heating in the vast majority of African homes is wood. But while the demand in Africa for wood energy is increasing, the supply is rapidly decreasing. New approaches to local involvement in fuelwood production and use are frequently subsumed under the title, Forestry for Local Community Development (FLCD). The concern of small private and large multinational donors over improved approaches to forestry is focused on ways to help communities identify and supply fuelwood and other forestry needs from the "bottom-up" rather than from the "top-down." In this approach, local residents are brought into management decisions on integrated land and resource use, and communities are shown how to share the benefits of fuelwood production. The FLCD approach raises a number of issues which were not considered important in industrial forestry. The approach calls for reorienting goals and expectations, and redesigning training, equipment, and managerial supports as well as a new type of commitment on the part of donors, technical support agents, and local residents. All three groups must recognize the need for integrated natural resources and energy planning at regional, national, and local levels. Not all initial FLCD projects have succeeded. Most projects which eventually failed, did so because one or more of the following six elements were unclear when the project began: (1) identification of, and criteria for participants; (2) clearly stated long and short-range goals; (3) project lands clearly identified, adjudicated, and dedicated for the duration of the project; (4) start-up and maintenance planning with a schedule of inputs, and with responsible parties identified; (5) specification of benefit distribution giving details of to whom, how, when, and where benefits are to be distributed; and (6) a plan for evaluation which provides for timely feedback and flexibility in support of and, when necessary, redirection of the program. The next step after wood is produced entails transforming it from a tree to usable fuel with as little waste as possible. Transformation of wood includes harvesting, charcoal production, transporting, and drying and storing the woodfuel. To diminish waste, regional and national energy, fiscal, and transportion policies must be coordinated. The introduction of fuel-saving stoves could have an immediate impact on available fuel. African women have found the three-stone stove or other modifications on the open fireplace to be the most appropriate technology for cooking their daily meals; however, there has been little donor interest in wood stove improvement, and laboratory-tested models have failed to gain recognition among villagers. This is due to the confusion between the experiment and the demonstration-dissemination phases of the projects.

Failure to disseminate stove models is blamed on traditional attitudes of women or ineffective extension services, when in fact the experiment phase has not been completed. Experiment designing should be done in areas where women are interested in stoves for saving fuel and where they use experimental stoves in their homes as paid members of experimental teams. The demonstration-dissemination phase should start only when the team members feel that the model has been modified to satisfactorily meet the requirements of local cooking. A 49-item international bibliography of reports and books relating to community participation in fuelwood production is appended to this paper.

43. International Council for Research in Agroforestry. ICRAF.
A pamphlet prepared by the International Council for Research in Agroforestry, Nairobi, Kenya. Undated, 8 p.

DIC Catalog Number: 634.9 I61

Much land in the developing world is mismanaged, underutilized, or unused. Shifting cultivation practices, ecological degradation in Sahel areas, removal of tropical upland vegetation in Asia, and neglect of savannas in Latin America are wasting potentially productive land resources when food demands are great. The rehabilitation of these wasted lands through the application of agroforestry is a primary concern of the International Council for Research in Agroforestry (ICRAF). In a descriptive pamphlet, ICRAF outlines the design of two programmes to promote agroforestry systems which would result in better land use without environmental damage. The Core Research Programme will collect and disseminate data and information, publish abstracts and research results, plan field research programs, and train researchers at all levels in agroforestry, while the Field Research Programme will prepare, implement, monitor and coordinate field research projects. The Field Research Programme will include activities which address the problems of shifting cultivation practices, and agroforestry in arid zones, savannas, and tropical upland ecosystems. Research on shifting cultivation practices will evaluate past and current practices; select multi-purpose tree species which will ensure the restoration of soils and provide high yields of fruit, wood and fodder; conduct forest trials to determine the placement of forest plantations with respect to agricultural crop cultivation; examine the effect of "multi-storey" growth of annual food crops with perennial trees, simulating the layered arrangement of natural tropical forest ecosystems; and introduce planned tree fallows to improve soil fertility and reduce weed growth while producing marketable products. In order to prevent arid zones from becoming man-made deserts because of unutilization, ICRAF will undertake studies of intensified fuelwood production, and integration of tree production with animal or crop production. The ICRAF will also collaborate with the International Centre for Tropical Agriculture in research on savanna lands of the American tropics. These areas have acid soil of low fertility which limit cultivation and are susceptible to erosion if plant cover is damaged. Research will be directed to those parts of the savanna which are suitable for grazing combined with improved pastures and agriculture. Research activities will include testing for species most suitable for fodder, live fencing, and shade; and managing controlled savanna burning to prevent destruction of beneficial trees. Tropical upland ecosystems are suffering destruction through increased demands for cultivable land made by growing local population and migration from

lowland areas. Forests are being cleared to provide fuel, fodder, and building materials. The difficult upland topography hinders soil conservation efforts. Research projects on this ecosystem will focus on those in the Himalayan foothills, and will emphasize the development, management, and evaluation of agroforestry systems in small watersheds, fodder species, and horticulture varieties and fuelwood species under different climatic conditions. Under the Core Research Programme, criteria will be developed for the selection of multi-purpose trees, and research will be encouraged where necessary. In addition, studies will be performed on the management and harvest of fodder trees, identification of potential fuelwood species, incorporation of fuelwood production with farming systems, and maintenance and improvement of soil fertility. A documentation service will assemble, assess, and disseminate existing information on agroforestry systems. Practical and theoretical training will be an integral part of each research project. The Core Research Programme staff will include a plant physiologist, soil scientist, agronomist, horticulturalist, silviculturalist, experts in range management and animal fodder production, rural economists, sociologists, and a documentalist.

44. Knowland, Bill and Carol Ulinski. Traditional Fuels: Present Data, Past Experience and Possible Strategies. Prepared for the Office of Evaluation, Bureau for Program and Policy Coordination, Agency for International Development under Contract AID/OTR-147-79-59. September 1979, 88 p.

DIC Catalog Number: 333.7 K73
Publication Number: PN-AAH-451

This document provides an overview of available data and theory on the use of firewood and other traditional fuels in developing countries. The report is based upon a review of available literature. Traditional fuels consist of firewood, charcoal, dried dung, and crop residues such as millet straw, rice husks, bagasse, and cotton sticks. Traditional fuels comprise 90 percent of all fuels used in the world's poorest countries. Nevertheless, these fuels have been almost totally neglected by foresters, energy specialists, and development authorities. In many areas, the use of fuelwood is rapidly outstripping supply — most notably in Nepal, Haiti, several Sahelian countries, and parts of India and Indonesia. In instances when dung and crop residues have been used for fuel, serious ecological problems such as reduced soil fertility, erosion, and water retention disrupt the natural soil cycle. Depletion of fuelwood has substantial socioeconomic effects as well. The gathering of firewood, which a decade ago was an hour's chore, may now involve a 10 kilometer walk or ride. Families commonly devote 200-250 person days each year to fuel gathering, reducing the time available for agriculture, cottage industries, or other productive activities. Possible solutions to this fuel crisis range from forestry interventions (establishing firewood plantations or village woodlots) and conservation, to the substitution of alternative fuels. Interest in agro-forestry is increasing. A number of fast-growing tree species such as Gmelina and Leuceana are already fairly well-known and could be adapted in many areas. In addition, fuel can be obtained from the trimmings and deadwood of trees grown for fruit, nuts, or other products. In Malaysia, firewood is scarcely a problem because of the ready availability of prunings from rubber plantations. Obstacles to such agroforestry solutions include problems of land distribution, property rights, and shortage of nursery stock, fertilizers, and irrigation water. More efficient use of fuels is another alternative. Most stoves and fireplaces in third world homes deliver only 2-10 percent (20 percent at most) of the fuel's energy content. (An American gas stove delivers 70 percent.) The Lorena stove, a promising new design constructed of clay and sand, is being used in Guatemala and Mexico. Overall, the basic thermodynamics of small combustion chambers has never been rigorously studied. VITA, ITDG, and other technology development groups have now begun basic research in this area. Traditional technologies for charcoal

production also could be improved. In addition, renewable energy sources such as solar power systems, windmills and generators, small hydro units, and biogas generators must be explored. Biogas, perhaps the most promising of these new technologies, permits the use of non-traditional sources of fuels, such as pig, poultry, and human wastes. Also, biogas provides high quality fertilizer as a residue. However, biogas can seriously worsen the fuel situation for the poor. If wealthy farmers begin using biogas, the poor and landless who traditionally collect the farmer's cowdung, will lose what may be their only source of fuel. While the use of biogas warrants strong encouragement, due consideration should be given to problems of equity. The authors recommend that AID integrate forestry components into comprehensive rural development programs. Urban fuel needs also should be considered. Other steps recommended by the author include: (1) long-term commitment by AID to traditional fuels; (2) development of American expertise in the problems of tropical deforestation; (3) cooperation with other international donors; (4) a review of all past efforts relating to forestry or traditional fuels; (5) strengthening of the information flow between AID/Washington and the field concerning traditional fuels and community forestry; (6) expansion of Peace Corps village energy surveys; and (7) examination of trends in the international charcoal trade. This report includes footnotes, charts on firewood consumption and charcoal trade in developing countries, and a 26-page bibliography, partially annotated.

45. National Academy of Sciences. Conversion of Tropical Moist Forests. A report prepared for the Committee on Research Priorities in Tropical Biology of the National Research Council of the National Academy of Sciences. 1980, 205 p.

DIC Catalog Number: 634.6 C766

This report surveys the rates at which the world's 9-11 million square kilometers of tropical moist forests are being converted to alternate uses and the main causes of this conversion. The author repeatedly notes the limitations of such surveys due to the difficulty of obtaining reliable information on forest conversion. Tropical moist forests are characterized by relatively limited seasonality in terms of temperature fluctuation and precipitation and by biological and ecological diversity. Conversion is defined broadly, as embracing forest alterations ranging from marginal modification through selective timber extraction to replacement of a forest by urban or industrial settlements. By far the most important cause of forest conversion is forest farming. Other causes include timber trade, cattle farming, and firewood cutting. Forms of each of these are analyzed. Country-specific surveys of the extent and causes of forest conversion are made for the regions of southern and southeast Asia and Melanesia, tropical Latin America, and tropical Africa. This survey reveals that deforestation is extensive, but also that it is taking place at highly differentiated rates. Areas in which rapid, moderate, and slow deforestation is occurring are specified. Of particular importance is the rapid conversion of rich forests, e.g., in northwestern and eastern peninsular Malaysia, the coastal forests of Brazil, and the southwestern Ivory Coast. Population growth, especially increases in the number of forest farmers, and economic aspirations augur an increase in forest conversion. But the present situation cannot simply be extrapolated into the future. The differentiation of conversion rates will continue as the causes of forest conversion are reduced (e.g., through innovations in agroforestry). In view of the overall deforestation problem, however, national governments and international development agencies urgently need accurate information on conversion rates, especially for priority areas. The use of remote sensing technology in gathering such information is recommended. An extensive bibliography on tropical moist forests and a list of persons contracted for information on forest conversion rates are appended.

46. National Academy of Sciences. Leucaena: Promising Forage and Tree Crop for the Tropics. Report of a study conducted jointly by the Philippine Council for Agriculture and Resources Research and the United States National Academy of Sciences, Washington, D.C. 1977, 115 p.

DIC Catalog Number: 633.37 N277
Publication Number: PN-AAD-727

The Leucaene genus is a versatile legume with many favorable features for easy growth and use as a crop plant in tropical and sub-tropical climates. It is a genus of Central American shrubs and trees with about 10 species, only one of which has been utilized extensively to date (L. leucaena (Lam.) de Wit). This report outlines existing information on leucaena, including current areas of research, and suggests future lines of inquiry for government agencies and research institutions engaged in development assistance and tropical research. Three broad catagories of L. leucaena exist: (1) Hawaiian type: short, bushy varieties (5m), flowering year-round; (2) Salvador type: tall, tree-like plants (20m) which produce twice the biomass of the Hawaiian type; and (3) Peru type: tall (15m), high foliage varieties. The high degree of genetic diversity shows promise for enhancing desireable characteristics such as high biomass or foliage ratios through horticultural techniques. Leucaena root sytems develop Rhizobium nodules for nitrogen-fixation, and taproots for extracting water from deep soil layers, below the root zone of most agricultural crop plants. While limited to low elevations in tropical or subtropical locations, leucaena can withstand wide variations in rainfall, sunlights, salinity, and land terrain, and shows high pest resistance (Hawaiian variety). Leucaena has a variety of uses as forage, fuel, timber, and for reforestation and soil improvement. Cattle, water buffalo, and goats can thrive on leucaena, which is high in protein. Stains which are low in mimosine are now in advanced stages of development. Leucaena also makes excellent firewood and charcoal. Its wood has uncommonly high density and caloric value for a fast-growing tree, and leucaena plants have strong regenerative properties. Arboreal varieties grow rapidly, yielding wood of useful size for lumber and timber. Because of the nitrogen-fixing association and resulting high nitrogen content of its foliage, leucaena enriches surrounding soils. Its aggressive root sytem also breaks up impervious subsoil layers, improving moisture penetration and reducing surface runoff. Leucaena can thrive on steep slopes in marginal soils, and in areas with extended dry seasons. This makes it a prime reforestation species. Specific recommendations for research and action include: (1) establishment of a leucaena seed reserve; (2) extensive trial-testing of leucaena varieties; (3) research in areas where uncertainties about leucaena cultivation will hinder its widespread use; (4) forage research and

trial-testing throughout the tropics; (5) silviculture research on the Salvadoran-type leucaena in tropics forestry programs; (6) immediate reforestation trials with leucaena where deforestation and soil erosion are severe; (7) establishment of pilot-size plantations for production of firewood, fuelwood, and charcoal; (8) research and testing in agroforestry, green manure, and shifting cultivation; (9) publication and dissemination of information about leucaena. Appendices provide lists of selected readings, panel participants, other leucaena researchers, and sources of leucaena seeds, inoculum, and wood. Summaries are provided in French and Spanish.

47. National Academy of Sciences. Research Priorities in Tropical Biology. Report prepared by the Committee on Research Priorities in Tropical Biology, Division of Biological Sciences, Assembly of Life Sciences, National Research Council, National Academy of Sciences. 1980, 116 p.

DIC Catalog Number: 574.9093 N277

Forests in the humid tropics are being rapidly depleted to meet the growing needs of the world's population. At present rates, most tropical moist forests will be gone by the turn of the century. Research necessary to counteract the potentially catastrophic effects of this massive destruction has not yet begun. This paper, prepared by the U.S. National Research Council Committee on Research Priorities in Tropical Biology, addresses the need for immediate scientific work in a variety of areas. The report is the result of three Committee meetings held during 1978 and 1979. Recommended research includes tropical plant and animal inventorying, studies of tropical ecosystems in various New and Old World settings, water and nutrient cycling, ecosystem energetics, physiological plant ecology, herbivory, higher order food webs, dynamics of micro-habitats and food patches, soils research, and tropical aquatic systems - rivers, lakes, and wetlands. Recommendations for immediate action include: (1) National schemes to monitor rates of conversion of tropical environments should be encouraged; (2) An international effort to complete an inventory of tropical organisms should be greatly accelerated, particularly in the next 25 years. Specific recommendations include: a)increase the number of taxonomists studying tropical organisms and develop institutions to support their work in tropical countries; b)stress specimen collection rather than specimen analysis; c)increase the conservation of genetic diversity in reserves; d)emphasize the biosystematics and evolutionary biology of representative organisms; e)give priority to areas containing the richest and most highly endemic biota, the most poorly known biota, and those in the most immediate danger of extinction. (3) Tropical ecosystems should be investigated in depth at particular locations selected on the basis of varied

criteria; (4) Tropical freshwater systems should be studied much more intensively because of their scientific and economic importance, and their usefulness in providing information about biological processes in drainage basins too large to be studied directly; (5) Precipitation chemistry and quantity should be monitored, especially in the Amazon, Orinoco, and Mekong drainages; (6) During the 5-year period of 1980-85, the following actions should be taken by every Nation: a)double the funds devoted to biological inventory in the tropics; b)increase by 50% the employment of professional systematists studying tropical organisms; c)initiate operations in ecosystem sites, and complete installation of physical facilities; d)encourage monitoring and reporting of conversion rates; e)establish committees to review the role of multinational corporations, international agreements, and general sociological phenomena in tropic forest depletion; and f)develop plans for a detailed study of aboriginal populations worldwide. Numerous references are included in this report.

48. National Academy of Sciences. Tropical Legumes: Resources for the Future. Report of an Ad Hoc Panel of the Advisory Committee on Technology Innovation, Board on Science and Technology for International Development, Commission on International Relations, National Research Council, National Academy of Sciences, Washington, D.C. 1979, 331 p.

DIC Catalog Number: 633.3 N277a
Publication Number: PN-AAG-844

This book discusses some of the lesser known legumes grown in the tropics on a limited basis — but which are potentially quite valuable in the search for food protein in lesser developed countries. The more familar legumes (peanuts, soybeans, peas, lentils, pigeon peas, chick-peas, mung beans, kidney beans, cowpeas, alfalfa, sweet clover, other clovers, and vetches) are second only to cereals as sources of human and animal food. However, legumes are two to three times richer in protein than cereal grains. Legumes are crucial to the balance of nature because of their ability to convert nitrogen gas from the air into ammonia, a soluble form of nitrogen, which is readily utilized by plants. Even today, cultivated legume crops add more nitrogen to the soil worldwide than do fertilizers. In addition, many of the legumes discussed in this book can thrive in poor soil and/or extremely dry climates. Chapters are devoted to the following groupings: root crops (yam bean, African yam bean, and other root crops; pulses (bambara groundnut, jackbean and swordbean, Lablab bean, marama bean, moth bean, rice bean, tarwi, tepary bean, tropical lima bean, ye-eb); fruits (carob and tarmarind); forages (forage shrubs and trees, Acacia tortilis, other forage Acacias, Prosopis species), fast-growing trees (Acacia auriculiformis, Albizia species, Sesbania

grandiflora, and other fast-growing trees); luxury timbers (Afrormosia, Intsia species, Pterocarpus species, rosewoods), and Miscellaneous (ornamentals, Sunnhemp, gums, and sources of green manure, soil reclamation, and erosion control). These chapters include descriptions of the subject variety, its limitations, and research requirements. A bibliography of selected readings and research contacts follow each chapter.

49. National Academy of Sciences. Underexploited Tropical Plants with Promising Economic Value. Report of an Ad Hoc Panel of the Advisory Committee on Technology Innovation, Board on Science and Technology for International Development, Commission on International Relations, National Academy of Sciences, Washington, D.C. 1975, 189 p.

DIC Catalog Number: 631.5 N277
Publication Number: PN-AAB-651

A report on tropical plants with a potential of improving the quality of life in their indigenous areas. Its objectives were to: (1) identify neglected but seemingly useful tropical plants, both wild and domesticated, with economic potential; (2) select those plants with the greatest promise for further exploitation throughout the tropics; (3) indicate the requirements and avenues for research to ensure that these plants reach their fullest potential. The 36 plants described here were selected from among 400 nominated by plant scientists around the world. Only a brief introduction to these plants is intended in this study. Each plant is presented in a separate chapter which is divided into the following subheadings: (1) description of the plant and its advantages; (2) limitations and special requirements; (3) research needs; (4) selected readings (significant reviews, general articles); (5) research contacts and germ plasm resources (individuals or organizations known by the panelists to be involved in relevant research or to have appropriate seeds, cuttings, or rootstock).

50. Natural Resources Defense Council. NRDC Tropical Moist Forests Conservation Bulletin Number 1. Bulletin prepared by the International Project, Natural Resources Defense Council, Washington, D.C. May 1978, 51 p.

DIC Catalog Number: 634.9 N277

The Tropical Moist Forests Conservation Bulletin is a publication of the Natural Resources Defense Council (NRDC) that delineates for decision-makers of major institutions concerned with tropical moist forests (as defined by FAO and UNESCO) the extent of present forest degradation, the threat this degradation poses to primary forests and the cultures dependent on them, and the need for protection, management, and reforestation. The first issue of the Bulletin presents an overview, admittedly incomplete, of the names, addresses, and programs of tropical moist forest institutions. A first section lists the programs of the UN and other multilateral organizations. Under the UN group are included the UN Development Program (UNDP); FAO, the autonomous agency which undertakes most UN forestry projects; UNESCO, particularly through the forestry sub-projects of its Man and the Biosphere (MAB) program and through its State of Knowlege Report on Tropical Forest Systems; and the UN Environmental Program (UNEP), which coordinates UN environmental activities and engages in forestry activities of its own, such as Earthwatch. Also included in this section of the Bulletin are descriptions of international, cooperative forestry programs in Switzerland, France, the Netherlands, and the USA (including the Organization of American States and the Inter-American Institute of Agricultural Sciences), the East Caribbean, Kenya, Austria, and of the new World Bank forestry policy emphasizing ecological effects of forest degradation and strategies to help those affected by them. Part two of the Bulletin lists bilateral and national forestry programs in developed and underdeveloped countries. Programs in Canada, the Federal Republic of Germany, France, Sweden, and the United Kingdom are listed, as well as US federal and private programs and institutions. Included under US federal activities are, among others, those of AID; the Environmental Protection Agency; the Council on Environmental Quality (which is preparing, at President Carter's request, a study of worldwide environment trends and a projection of the earth's environment in the year 2000); technical assistance services provided by the National Park and Forest Services and by the Smithsonian Institution; and the National Academy of Sciences/National Research Council, which currently has three committees engaged in tropical moist forest research. Private US organizations involved in forestry issues include, among others, the Natural Resources Defense Council, the Sierra Club Tropical Forests Program in New York, which recently undertook a comprehensive UNEP-supported study of deforestation in Venezuela; and the Ford Foundation. Listed in developing countries are programs and institutions in Latin America, including the

Instituto Brasileiro de Desenvolvimento Florestal (IBDF), whose projects include a two-year biological study of priority conservation areas in the Amazon; the Ecodevelopment Center (CECODES) in Mexico; and programs in Costa Rica, Ecuador, Guyana, Nicaragua, and Venezuela; Africa, including programs in Ghana, Ivory Coast, and Nigeria; and Asia, including the World Wildlife and MAB programs in Indonesia, and programs in Malaysia, the Philippines, Sri Lanka, and Thailand. Two brief final sections note upcoming forestry meetings: the 8th World Forestry Congress (Jakarta, Indonesia, 16-28 October, 1978) and the 5th International Congress of Tropical Ecology (Kuala Lumper, Malaysia, April, 1979) and forthcoming publications, including a report on forestry projects and environment (sponsored by the International Institute for Environment and Development) and Proceedings of the Paris Round Table Conference on Dipterocarps (June 1977).

51. Natural Resources Defense Council. NRDC Tropical Moist Forests Conservation Bulletin No. 2. Bulletin prepared by the International Project, Natural Resources Defense Council, Washington, D.C. December 1979, 29 p.

DIC Catalog Number: 634.9 N277a

The Tropical Moist Forests Conservation Bulletin, a publication of the Natural Resources Defense Council (NRDC), fosters the exchange of information and coordination of activities among organizations involved in tropical forest issues and provides a forum for discussion of tropical forest conservation, management, and research. In Bulletin No. 2, the effects of the rapid and apparently irreversible disappearance of tropical moist forests are described. Deforestation poses threats to the poor in developing countries who depend on these forests for fuelwood, food, and building materials; to 20% of the world's plant and animal species, many of which are of great importance for medicine, industry, agriculture, forestry, and applied biology; and to the global climate itself. Part I of the Bulletin lists current developments in the field: (1) The UN Environmental Programme (UNEP) meeting, planned for Gabon, February 25 - March 2, 1980, to develop a comprehensive international Plan of Action to control deforestation in the humid tropics and woodlands. Participants will include programme and resource managers from countries with such forests and interested major donor countries and international nongovernmental organizations; (2) A major forest resource conservation and watershed rehabilitation project in Panama (in connection with which President Royo declared a 24,000 hectare National Park in the Canal Zone watershed); (3) A survey by Dr. Norman Myers quantitatively documenting tropical moist forest conversion rates and evaluating prospects for changing present patterns of forest degradation; (4) President Carter's Environmental Message to Congress of August 2, 1979 stressing tropical forest conservation and detailing issues for increased

US attention; (5) New Congressional Mandates for forestry received by AID in June and August 1979; (6) The US Council on Environmental Quality/Department of State Global Year 2000 Study projecting the long-range effects of current deforestation; (7) A one-hour public TV film, "You Can't See the Forest ... Or the Trees", (scheduled for Fall 1980), developed by the Plant Resource Institute; (8) New publications, including "The Sinking Ark", a 240-page book by Dr. Norman Myers on the global problem of disappearing species as a result of tropical deforestation; "Proceedings of the US Department of State/AID Strategy Conference of June, 1978"; the "US Tropical Forest Interagency Task Force Report"; booklets on deforestation published by the Worldwatch Institute; "Issues in Tropical Deforestation", a 1978 handbook prepared by the International Environmental Center of the US Environmental Protection Agency; and the two new FAO publications providing updates on the scientific and technical aspects of rainforest conservation in the Amazon Basin: "Preservacao de Naturaya no Amazonia Brasiliera: Situacao em 1978" and "Wildlife Management and Planning in Brazil. Part II of the Bulletin provides a directory of institutes, programs, and periodicals concerned with tropical moist forest issues and is subdivided into two sections. The first provides 18 listings not given in Bulletin No. 1 of institutes and projects in Kenya, the USA, the United Kingdom, Australia, the Neterlands, Indonesia, the Philippines, Hawaii, Thailand, and New Guinea. The second section updates earlier Bulletin listings on 10 projects and organizations in Rome, France, Kenya, the USA, East Africa, and on Dr. Lawrence Hamilton's study of Mangrove ecology and conservation. Addresses, including addresses for obtaining publications, are provided in both parts of the Bulletin.

52. Proceedings of the USAID Asia Bureau Conference on Energy, Forestry, and Environment, Manila, November 12-16, 1979. Conference organized by the Office of Technical Resources, Bureau for Asia, U.S. Agency for International Development. 1979, 303 p.

DIC Catalog Number: FEA 333.79 A265
Publication Number: PN-AAH-942

This report contains proceedings of the USAID Asia Bureau conference, held in Manila, November 12 - 16, 1979, on energy problems and policies in Asia and their related forestry and enviornmental aspects. The purpose of the Conference, which was attended by energy experts, host-country specialists, AID and USAID officials, and donor agency representatives, was to make preliminary recommendations for AID assistance to Asian LDC's in ameliorating their energy problems. Conference presentations were of three types: papers presenting overviews of major issues; papers analyzing current energy planning; and AID country background papers. Energy's role in development was addressed from various perspectives: interantional, national, regional, functional, and sectoral. Workshop discussion groups examined the energy situation and options in India, Nepal, Philippines, Thailand, Indonesia, Sri Lanka, and Bangladesh and possible AID roles supporting energy planning and programs in those countries. Several conclusions were drawn: (1) Since several countries are experiencing a critical firewood crisis, AID should assist in augmenting fuelwood supplies and developing energy alternatives for rural areas. (2) AID needs to address the effects of the oil crisis in Asia by promoting conservation and developing renewable energy sources. (3) Energy strategies should be devised to meet the needs of both rural and urban sectors. (4) The energy implications of non-energy projects must be addressed more thoroughly in project development. (5) A central training course in energy issues needs to be established for AID mission personnel and the inclusion of energy specialists on mission staffs should be considered. (6) AID should increase collaborative energy assistance activities with other donors, particularly with the Goverment of Japan and the Asian Development Bank. (7) A problem-oriented regional conference such as the present one is an effective vehicle for developing sound AID energy policy. A list of conference participants is included.

53. Qureshi, Ata H. and others. Assessing Tropical Forest Lands: Their Suitablity for Sustainable Uses - A Report of the Conference on Forest Land Assessment and Management for Sustainable Uses, June 19-28, 1979, Honolulu, Hawaii. East-West Environmental and Policy Institute, East-West Center, Honolulu, Hawaii, January 1980, 69 p.

DIC Catalog Number: 333.75 Q9

This report presents a practical approach to classifying the capability and assessing the suitablity of tropical forest lands for sustained productive use. Its objective is to help land use planners to allocate land resources properly into productive units, each easily sustained with available production technology and land management techniques. This productive use requires knowledge about the ecological (biophysical) characteristics of the land, an ability to predict the response of the land to human and natural perturbations, and a display of the information in map form. Land classification procedures are presented at two levels of scale. Overview level refers to land capability classification on a reconnaisance scale (1:50,000 to 1:1,000,000), showing an entire state, province, or government district on a single map sheet. Detailed level refers to a large map scale (1:1,000 to 1:50,000). The authors break down the land use planning process into eight major steps: (1) determining the level of decision-making, priorities for land use, and time and money available; (2) gathering and organizing ecological and biophysical data; (3) processing and reducing data to simple parameters; (4) presenting the land capability classification in the form of maps, models, profile diagrams, and other displays; (5) assessing land suitability for various uses and presenting ratings in the form of maps and tables; (6) determinining feasibility; and (7) allocating landscape units to specific uses. In addition, recommendations for future multinational collaborative research are briefly discussed. A bibliography is included (71 entries, 1931-1979).

54. Ulinski, Carol A. Fuelwood and Other Renewable Energies in Africa: A Brief Summary of U.S.-Supported Programs. Prepared as background material for members of the Workshop on Fuelwood and Other Renewable Fuels in Africa, to be held in Paris, November 29 and 30, 1979. November 16, 1979, 48 p.

DIC Catalog Number: AFR 333.7 U39a
Publication Number: PN-AAH-450

This paper provides brief narrative descriptions of AID projects and research activities supporting the use of fuelwood and other renewable fuels in Africa. The paper is purely descriptive and does not critically analyze the projects. The contents include: (1) comments on the legislative mandate which underlies AID's current renewable energy activities; (2) summaries of 15 forestry and fuelwood projects supported by AID; (3) summaries of 13 AID-funded projects in other renewable energy technologies; and (4) comments on the Peace Corps' forestry and renewable energy program. AID projects and funding amounts are listed in Annex 1. Annex 2 lists AID commitments to the Club of the Sahel/CILSS Ecology and Forestry Program. AID-supported energy development, by technology and country, is summarized in Annex 3. A 44-item international bibliography of reports and books related to renewable energy and forestry follows the Annexes. AID's energy assistance to developing countries emphasizes renewable and nonconventional energy sources which are responsive to rural needs, environmentally sound, inexpensive, simple to use and maintain, and easily replicable. Also, to maintain and increase forest resources important for firewood and needed wood products, AID's assistance for forestry projects emphasizes community woodlots, agroforestry, reforestation, watershed forest protection, and forest management. AID's 15-project forestry portfolio of current and proposed activities is principally concerned with planting and managing trees for fuelwood production. Other activities are broader in scope and include support for a range of interventions such as institution building, training, land-use and natural resources planning, and resource convervation pilot projects involving dune stabilization, planting Acacia albida in farm fields, and planting live fences. In addition to four studies and surveys on firewood, reforestation, and community participation in forestry, AID is also supporting establishment of regional remote sensing centers in East and West Africa. The resulting satellite imagery is expected to be valuable in planning and managing natural resource programs. AID development of other renewable fuels emphasizes energy needs in cooking, heating, water supply, grain grinding, irrigation, handicrafts, and other basic life functions, activities that represent 80% of all energy consumed in Africa for all purposes. In some instances, energy components are being incorporated into existing health, agriculture, education, and rural development projects. In other instances, new projects are being supported.

Current and proposed projects involve institution building, data collection, and applied research and development on small-scale renewable energy technologies (wood burning stoves, solar crop and fish dryers, wind systems, photovoltaic and rankine cycle pumps, solar stills, peat exploitation, pyrolytic converters, charcoal-making techniques, mini-hydrogenerators, and biogas digestors). For the most part, Peace Corps activities in forestry and renewable energy have been "ad hoc", and volunteer effectiveness has been limited by the lack of technical and material project support. However, Peace Corps has been strengthening its capacity to address problems of deforestation and shortages of petroleum. A major forestry initiative is under way, and a global renewable energy program has been launched to (1) design, test, and conduct energy surveys to identify village needs and resources, and (2) to identify, design, and implement renewable energy projects. Seven countries are participating in the first phase: Micronesia, the Philippines, Dominican Republic, Senegal, Paraguay, Ecuador, and Mali.

55. Ulinski, Carol A.. U.S. Forestry and Ecology Program in the Sahel. Report prepared under Contract AID/afr-C-1453 and submitted to the Special Development Problems Division, Office of Development Resources, Bureau for Africa, Agency for International Development, October 31, 1978, 61 p.

DIC Catalog Number: AFR 333.7 U39b
Publication Number: PN-AAG-242

Describes the Forestry and Ecology Program of the Club of the Sahel, and the U.S. contribution of this regional effort to arrest and reverse the process of desertification in sub-Sahara Africa. The objective of the Club is to undertake long-range planning and programming for increasing the region's agricultural productivity while maintaining an ecological balance. AID field commissions have formulated projects designed to address the problems of deforestation, firewood shortages, and the general deterioration of the Sahel's natural resources base. Reviews project-by-project the current and proposed AID program in forestry and ecology. Also describes some activities of the Peace Corps and U.S. private voluntary organizations.

56. United Nations. United Nations Conference on Desertification: Round-Up, Plan of Action and Resolutions. Conference held August 29 - September 9, 1977, Nairobi, Kenya. 1978, 43 p.

DIC Catalog Number: 333.73 U58

Desertification of land is the decrease in its biological potential. This process has intensified in recent decades and particularly threatens the earth's dry lands (which constitute nearly one-third of its area) and their 628 million inhabitants. Recent severe desertification immediately threatens 50 to 78 million people. When 650,000 square kilometers in the African Sahel became desert in 1974, the UN General Assembly passed a resolution calling for a UN conference to produce a comprehensive and world-wide plan to combat desertification. The conference was held in Nairobi, Kenya, August 29 - September 9, 1977 and was attended by 500 delegates from 94 countries. In preparation for the conference, reviews and studies (which became the conference's main document) were commissioned. Their findings and recommendations are reflected in the conference's Plan of Action which, together with resolutions adopted, a conference round-up, and a brief summary of associated activities, constitutes the present monograph. The Plan contains 28 recommendations, most of which concern the short-term goal of preventing and arresting desertification and, where possible, reclaiming desertified land for productives use.

57. United States Department of Agriculture, Forest Service, Forest Products Laboratory. Papers for Conference on Improved Utilization of Tropical Forests. Conference sponsored by the U.S. Forest Service and the Agency for International Development and held in Madison, Wisconsin, May 21-26, 1978. 1978, 442 p.

DIC Catalog Number: 634.9063 C748
Publication Number: PN-AAF-653

This document contains 26 papers submitted at the Conference on Improved Utilization of Tropical Forests. The purpose of the conference was to familiarize those attending with the most up-to-date information about utilization of tropical forests. The major issues discussed are: resources and environmental concerns, silviculture, harvesting and transportation, wood fiber and reconstituted products research, industrial practices and plans, and investment considerations. Emphasis is on research that the Forest Products Laboratory recently completed but other research conducted worldwide is also included. Some of the papers concern anatomical characteristics of tropical woods, little known woods of the Brazilian Amazon, bleached kraft pulp form mixed hardwoods from Ivory Coast forests, properties of particleboards from mixtures of Philippines hardwoods, utilization of bleached sulfate tropical hardwood pulp, and problems in process chemical production in developing countries. This report should provide a good background in the problems and promises of improved utilization of the tropical forest.

58. United States Water Resources Council. Water Resources Planning Act (Public Law 89-80 As Amended). United States Water Resources Council, Washington, D.C. 1977, 15 p.

DIC Catalog Number: US 333.91 U58

The Water Resources Planning Act, Public Law 89-80, was enacted July 22, 1965 to provide for optimum development of United States' water and related land resources. The Act authorizes establishment of the US Water Resources Council and regional river basin commissions empowered to coordinate planning and funding of river basin development projects. Title I of the Act describes the make-up and functions of the Council. Membership of the Council includes the heads of eight Federal agencies and a chairman appointed by the President. The Council's overall responsibility is to monitor current and prospective water and related land resources requirements and supplies and to ensure conservation, development, and utilization of those resources. To effect this mission, the Council recommends to the President the establishment of River Basin Commissions for the various water resources regions of the United States. A primary function of the Commissions is to produce comprehensive river basin development plans. Standards for such plans, and determinations of the efficacy of plans submitted by the Commissions, are made by the Council. After review of the Council's recommendations, the Predident may make his own recommedations to Congress in regard to authorization of Federal projects to implement river basin development plans. The Council also assesses the adequacy of existing and proposed water basin plans, programs, and statutes in meeting the requirements of Federal policies and programs and in satisfying the needs of larger regions of the nation. Under Title II, River Basin Commissions are established by declaration of the President following approval by the Council of a request for authorization submitted by a State (or States, if the Commission serves regional interests). A Commission coordinates Federal, State, interstate, local, and nongovernmental planning for, and execution of, development of water and related land resources in its areas, river basin, or group of river basins. Membership of Commissions includes a Presidential appointee as chairman, officials of Federal agencies determined to have substantial interests in the Commission's work, a representative from each state involved with the Commission, and other members appointed by the President from organizations having any manner of jurisdiction over river basin activities. Commissions may be terminated by the Council or a majority of the states composing the Commission. Title III authorizes financial assistance to the States for comprehensive planning grants. Allotments are based on population, land area, need for water basin programs, and financial need of respective States. The Council pays more than 50 per centum of each State's program costs. Title III also provides for review of Commission's programs and cancellation of payments, and for Commission's accounting. Title IV authorizes up to $6,000,000 in additional appropriations for annual Federal expenses

of Commission's operations; up to $2,000,000 for annual expenses of the Council; and up to $10,000,000 for assessment and plans prepared by the Council of the Commission. Also included under Title IV are various rule and regulations and guidelines for delegation of Council functions and use of personnel. Appended to the Act are a legislative history of P.L. 89-80 and notes to the Act citing sections of their public laws related to P.L. 89-80.