**Chapter** 5

# Organizations Dealing With Tropical Forest Resources

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Chapter 5

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## HIGHLIGHTS

- Many organizations are involved in work to sustain tropical forest resources, but the expertise, knowledge, and funds available are inadequate. This is partly because forestry is a peripheral interest for most of the organizations.
- The limited funds available are not used efficiently because the activities of the many organizations do not complement one another well. There is some prospect that the International Union of Forestry Research Organizations (IUFRO) and the Forestry Department of the Food and Agriculture Organization (FAO) will begin to coordinate the international efforts.
- Coordinating diverse organizations' resource development projects at the national level is the role of the tropical governments. Development assistance agencies have done little to enhance the governments' capabilities for this task, but some promising new programs, such as Cooperation for Development in Africa (CDA), are being developed.
- Because tropical forests are not the central interest of any major U.S. organization, U.S. expertise is widely scattered among many organizations. Cooperative agreements between organizations (e. g., U.S. Agency for International Development/U.S. Forest Service) can bring together this expertise effectively.

## THE ROLE OF ORGANIZATIONS

Substantial institutional activity is occurring worldwide that directly or indirectly affect; tropical forest resources. The U.S. Agency for International Development (AID), the United Nations agencies, the World Bank, and others have increased their attention to forestry in recent years (16,24). Private corporations and nonprofit organizations also have been involved in the search for solutions to tropical forest problems. And most importantly, the governments of tropical nations have come to recognize that deforestation constrains their economies and their development options. This chapter reviews the types of organizations in the United States and abroad that help sustain tropical forest resources through research, technology development and transfer, institution building, and funding.

U.S. and international organizations play a variety of roles in developing and implementing technologies to sustain tropical forests. The nature of each organization's activities varies with its objectives. Some organizations offer grants or loans, while others carry out research, technology transfer, or education. Some work at the village level, while others are organized for international efforts. Many organizations are mandated to focus on a particular region or a particular issue. Some support the use of existing forests, others concentrate on planting trees for immediate needs,



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while other organizations conduct the basic or applied research needed to develop sustainable forestry systems for the future. This institutional diversity ensures that there will be no unrealistic search for the "one answer" to tropical forest resource problems.

This diversity of functions and goals, however, can create problems and inefficiencies. Different organizations sometimes work at cross purposes, without knowledge of the other's actions. Similarly, unnecessary duplication of efforts can occur. On occasion, counterproductive competition occurs between organizations or between assistance-giving nations. Often, there simply is a lack of communication between the various groups. Thus, many different groups may carry out many necessary actions, but no one determines whether all the necessary actions are conducted or whether the activities are appropriately timed relative to one another.

Tables 8 through 15 list a selection of important U.S. and international organizations that are involved in tropical forest resource activities. For a more complete discussion of the various institutions listed, see OTA Background Paper #2, ***Sustaining Tropical Forest Resources: U.S. and International Institutions.***

It is important not to be misled by the apparently large number of organizations. Even though a great many organizations are involved in tropical forestry work, in few of these are reforestation, forest maintenance, or conservation a high priority. These organizations devote far more staff and funds to other types of development activity than to forestry. In fact, the total amount of funding devoted to forestry remains small relative to the needs. Also, care must be taken to avoid double-accounting, since the forestry funds for some organizations come from the forestry funds of other organizations. Despite the recent expansion of social forestry, international assistance for forestry is still dominated by industrial projects. Analyzing the effects of that dominance, a recent U.S. Forest Service report states:

> Industrial assistance projects cover heavily capitalized pulpmills and sawmill complexes, rather than on-the-ground establishment and management of forest stands. Continuation of this trend would exert greater pressure on existing forest reserves and contribute to the deforestation problem (24).

Because the scope of forest problems and opportunities is so extensive and is affected by many interacting economic, social, political, and ecological factors, sustainable development can only be achieved when major changes are instituted by the tropical countries themselves. Actual solutions to the forest resource problems generally will require actions at the village level by local people.

Nevertheless, national and international organizations based outside the Tropics can af-

**Table 8.—U.S. Government Organizations**

**Agency for International Development, Washington, D. C.: international development, institution building with congressional mandate to address forest-related problems in the developing world. AID funding supports other organizations listed in this table**

**National Science Foundation, Washington, D. C.:** Grants for U.S. scientists to do fundamental research **in tropical biology**

**National Academy of Sciences, Washington, D. C.:** Funds projects and research on sustaining tropical resources, primarily through Board on Science and Technology for International Development (BOSTID)

**Peace Corps, Washington, D. C.:** Volunteers for development activities worldwide, including forestry and conservation

**Smithsonian Institution, Washington D. C.:** Basic research on tropical ecosystems

Us. **Department of Agriculture**

- **Office of International Cooperation and Development:** Grants **for agricultural research, development assistance, and technical assistance**
- **Agricultural Research Service:** Soil and water conservation research; includes Puerto Rico, Virgin Islands
- **Forest Service**
  **Pacific Southwest Forest and Range Experiment Station: U.S. tropical forests, Hawaii, U.S. Pacific territories**
  **Institute of Pacific Islands Forestry:** U.S. tropical forests
  **Institute of Tropical Forestry (Puerto Rico):** Tropical timber management, plantation silviculture
- **Soil Conservation Service: Soil management support for tropical countries**

Us. **Deparment of the Interior:**

- **National Park Service (International Park Affairs): Park planning, management, and conservation training**
- **Fish and Wildlife service: Assist management and planning** for conservation (under the Endangered Species Act, etc.)

**U.S. Department of State: Research on tropical ecosystems through MAB (Man and the Biosphere). 1984 funding uncertain**

SOURCE: Office of Technology Assessment.

### Table 9.- Nongovernment Organizations Based in the United States

**Arnold Arboretum, Cambridge, Mass.:** Evolutionary biology
**East-West Center, Honolulu, Hawaii: Graduate research, education, and information exchange throughout Asia**
**International Institute for Environment and Development, Washington, D. C.: Studies sustainable economic and social development, including energy, human settlements, environmental impacts**
**Missouri Botanical Garden, St. Louis, Me.: Tropical flora, botany, and research**
**National Wildlife Federation (International Program), Washington, D. C.: Largest western conservation group: 4.5 million members. International initiative is recent**
**Natural Resources Defense Council, Washington, D. C.: Legal assistance, monitors natural resource policies and decisions**
**The Nature Conservancy (international program} Washington, D. C.: Inventory, acquisition, and protection of natural areas**
**The New York Botanical Garden, The Bronx, N. Y.:** Taxonomic research, neotropical plant collection, economic botany
**Rare Animal Relief Effort, Washington, D. C.:** Environmental education and training in Latin America
**Pacific Tropical Botanical Garden, Kauai, Hawaii:** Tropical botany
**Sierra Club International, Earth Care Center, New York, N. Y.:** An information clearinghouse including protection of fragile areas, tropical rain forest mangement and conservation
**Volunteers in Technical Assistance, Arlington, Va.:** Technical assistance in development-oriented projects
**World Resources Institute, Washington, D. C.:** Policy studies on natural resources management, particularly in developing countries
**World Wildlife Fund-U.S., Washington, D. C.:** Funding for conservation of living resources, international wildlife conservation

SOURCE: Office of Technology Assessment

### Table 10.—Consortia

**Board for International Food and Agricultural Development:** To increase involvement of U.S. agricultural universities in AID
**CamCore:** Focus on industrial forestry in tropical America
**Organization for Tropical Studies:** Consortium providing graduate training and university research on tropical biology
**South-East Consortium for International Development:** Consortium providing development assistance
**Universities for International Forestry:** Consortium providing experience in forestry and forestry-related problems

SOURCE: Office of Technology Assessment.

### Table 11 .—Multilateral Development Banks

**African Development Bank:** Loans total $635 million; U.S. contributes indirectly through Africa Development Fund. involved in forestrty in Ethiopia, Liberia, Ivory Coast
**Asian Development Bank:** Growing attention to community forestry, including fuelwood and environmental protection
**Inter-American Development Bank:** Investigating potentials for greater involvement in forestry activities
**World Bank:** Loans for development, Trend away from monoculture and forest industry toward projects to sustain tropical resources

SOURCE: Office of Technology Assessment,

### Table 12.—Major International Nongovernment Organizations

**BIOTROP:** Information, training, and research institute in tropical forestry and biology
**CARE:** Renewable resources program promoting conservation of forests and forest dependent resources in the Tropics
**Centro Agronomic Tropical de Investigation y Ensenanza (CATIE):** Improvement of annual and perennial crop and plant production systems, and animal production on small farms
**Permanent Interstate Committee for Drought Control in the Sahel (CILSS):** Association of eight Sahelian countries (Cape Verde, Mali, Mauritania, Niger, Senegal, The Gambia, Chad, and Upper Volta) to foster coordination of efforts in the region
**Commonwealth Forestry Institute:** Associated with Oxford University; reforestation of degraded sites and promoting fast-growing plantations
**Consultative Group on International Agricultural Research:** Supports and promotes international system of agricultural research centers and programs. Thirteen research centers
**Eastern Caribbean Natural Areas Management Program:** Research, training, and field projects to strengthen local capacity to manage living natural resources
**International Council for Research in Agroforastry:** Seven programs: management, information services, training, researchlevaluation, technology research, field stations, and special projects
**Institute for Terrestrial Ecology:** A group of research laboratories in the United Kingdom. Projects on regenerating hardwoods in West Africa and vegetative reproduction of tree species
**Intermediate Technology Development Group:** Nonprofit organization that offers consultants to developing countries for improving social forestry, household energy, and industrial energy projects
**International Development Research Centen** Canadian group for development research, including studies of social forestry, agroforestry, and sustainable agriculture. Funded by Canadian bilateral aid
**International Society of Tropical Foresters:** Information transfer. About 1,000 members
**International Union for the Conservation of Nature and Natural Resources:** Six commissions: ecology, education, environmental planning, species survival, national parks and protected areas, and environmental policy, law, and administration
**International Union of Forest Research Organizations:** international cooperation in forestry research through correspondence, seminars. About 10,000 members
**Lutheran World Relief:** Financial support to other agencies, including Lutheran World Service for tropical forest projects
**Lutheran World Service:** Community development services, including health care, education, agricultural development. Also reforestation, community forestry
**World Wildlife Fund—Intemational:** Largest nongovernmental organization for conservation of tropical forests, species, and habitats

SOURCE: Office of Technology Assessment.

**Table 13.—United Nations Agencies**

| |
|---|
| **Food and Agriculture Organization:** Emphasizes agriculture: Has four forestry programs: forest resources and environment, forest industries and trade, forest investments and institutions, and forestry for rural development |
| **United Nations Environment Programme:** U.N. coordinating agency for environmental activities |
| **United Nations Educational, Scientific, and Cultural Organization:** Tropical forest research, protectd natural resources. Includes MAB |
| **United Nations University (Natural Resources Program):** international centers for research, post-graduate training, and dissemination of knowledge. Programs in agroforestry, energy |
| **World Food Programme:** Supplies food for disaster relief and through Food for Work projects. Some reforestation and woodlot establishment |

SOURCE: Office of Technology Assessment

**Table 14.—Private U.S. Foundations Funding Tropical Forestry Research and Projects[a]**

| |
|---|
| 1. Ahmanson Foundation |
| **2.** Andrew W. Mellon Foundation |
| **3.** Atlantic Richfield Foundation |
| **4.** Camille and Henry Dreyfus Foundation, Inc. |
| **5.** Exxon Education Foundation |
| **6.** Ford Foundaton |
| Ford Motor Company Fund |
| **8.** Inter-American Foundation |
| **9.** John D. and Catherine T. MacArthur Foundation |
| 10. Mobil Foundation |
| **11.** Morgan Guaranty Trust Co. of New York |
| **12.** Richard King Mellon Foundation |
| **13.** Rockefeller Brothers Fund |
| **14.** Rockefeller Foundation |
| **15.** Shell Companies Foundation |
| **16.** Tinker Foundation |
| **17.** W. K. Kellogg Foundation |
| **18.** Wallace Gerbode Foundation |
| **19.** Weyerhaeuser Foundation |

[a]In general,, few U.S. foundations have substantial international programs. Support for all tnternatlonal and foreign projects amounts to only about 4 percent of the approximately $2.4 billion awarded each year by U.S. private foundations (20). Total U.S. foundation support for tropical forest projects, though difficult to calculate, probably averages between $10 million and $12 millIon a year

SOURCE: Office of Technology Assessment.

feet the willingness and ability of tropical countries to take necessary steps. It is unlikely that bilateral and multilateral aid will fund enough tree planting and conservation to compensate for tropical deforestation and forest degradation. Instead, outside organizations can focus on improving the technical and managerial capabilities of organizations in tropical countries. Following this view, the priority areas for assistance would be forest resource research and technology development, technology transfer, institution building for forest-related education and planning, and measures to increase the productivity and sustainability of agriculture.

**Table 15.—Major Foreign Bilateral Organizations**

| Count-~ | Organization | Function |
|---|---|---|
| Canada | Canadian International Development Agency (CIDA) | Funds infrastructure for forest industries and conducts inventories and development plans for commercial wood production |
| France | Centre Technique Forestier Tropicals (CTFT) | Projects include technical assistance, plantation operation, reforestation, and silvicultural research on tropical pines and eucalyptus |
| Japan | Japanese Overseas Afforestation Association (JOAA) | Tests plantation establishment and maintenance techniques for exotic pulpwood species, mostly in Southeast Asia |
| Sweden | Swedish International Development Authority (SIDA) | Develops infrastructure for forest industries. Supports community forestry and fuelwood projects, in part through a trust fund for FAO |
| United Kingdom | Overseas Development Administration (ODA) | Tropical forestry research focuses on silvicultural techniques and genetic improvements of tree species, especially pine |
| West Germany | Bundesministerium fur wirtschaftliche Zusammenarbiet (BMZ) | Funding arm of bilateral assistance |
| | Gesellschaft fur Technische Zusammenarbeit (GTZ) | Implements forestry projects. Priority areas are forest conservation and production, institution-building, and timber technology and processing |

SOURCE Off Ice of Technology Assessment

## TYPES OF ORIANIZATIONS IN TROPICAL COUNTRIES

### Research Organizations

Some 40 organizations in tropical countries conduct significant research related to forest resources (23). The majority of these are weak and have been severely constrained by lack of staff and funding. Nevertheless, most of these organizations are carrying out some research to support the recent shift in tropical forestry priorities (e.g., research related to contribution of forestry to rural development, energy production, and conservation and management of tropical forest ecosystems).

### Educational Organizations

There are 23 university degree programs in forestry in tropical Africa, 55 in tropical Asia, and 39 in tropical America (15 of these are in Brazil). In addition, tropical Africa has 59 technical schools offering forestry courses, tropical Asia has 118 (49 are in India and 19 in the Philippines), and tropical America has 51 [19 are in Brazil and 14 in Mexico) (7). These numbers may give a misleading impression that there is sufficient capacity in forestry education and training. But most of these schools are new and small, producing few graduates each year.

Some tropical countries, particularly in Southeast Asia, have introduced commendable interdisciplinary resource management programs, A new forestry program in Bihar, India, has a sizable curriculum in related social sciences. Nepal's Tribhuvan University sends all of its graduate students to work in villages for 1 year,

### Regulating Agencies

Regulatory agencies with responsibilities related to forests have proliferated in many countries. In addition to forest departments, agencies concerned with planning and finance, agriculture, mines, water resources, energy, parks, wildlife, industrial development, and military matters and internal security have regulations and policies that affect forests in some way. In 1972, only 11 developing countries had environmental ministries or high-level agencies; that number has now reached 102 (9).

In many tropical countries, regulation is hampered by administrative structures, bureaucratic lethargy, low enforcement capability due to remoteness and extensiveness of forest lands, lack of vehicles or fuel, insufficient number or training of staff, and low pay. Where corruption occurs, the policing approach is unable to cope with illegal commercial logging, with excessive hunting and gathering, and with spontaneous agricultural clearing within reserve forests and protected areas.

### Project-Implementing Agencies

In most tropical countries, the agencies that are responsible for regulation also implement resource development projects. This can cause some problems in project implementation, especially for social forestry. It is difficult to create a dialog between foresters and local people if the forest department is perceived as a paramilitary organization. Also, paramilitary discipline can discourage innovation within the ranks of the Forest Department, particularly if promotions are based mainly on seniority (21).

One weakness of many project-implementing agencies is that little long-range planning is done. There is a shortage of qualified personnel, good data, and funds for planning (15). In some tropical countries, technical forestry skills are in short supply and many jobs remain unfilled. The foresters often lack the special skills needed for social and environmental forestry (e.g., communications, interpersonal relations management, economics, sociology, and ecology). In many forestry departments, the new types of projects such as fuelwood or social forestry do not have prestige or provide career advancement opportunities. Further, field work is generally left to the most inexperienced staff while the best workers are promoted quickly to central forestry department offices (17).

### Nongovernmental Organizations (NGOs)

NGOS concerned with forestry, rural development, and the environment have been established within tropical countries. Examples include the grassroots Chipko or “hug-a-tree” movement in India, Green Indonesia, Earthman Society in the Philippines, Fundacion Natura in Ecuador, Pronatura in Paraguay, Grupo Ecologico Tolima in Colombia, and the Peruvian Association for the Conservation of Nature. The Environment Liaison Centre in Nairobi helps coordinate activities of environmental NGOS, particularly in Africa. NGOS have done important applied research in Kenya and Sri Lanka. In Gujarat, India, NGOS helped spread farm forestry and fuel-efficient woodstoves and crematoria. NGOS in Malaysia, Costa Rica, and Haiti also have implemented projects successfully.

## INTERNATIONAL ORGANIZATIONS

Although a great many bilateral and multilateral development assistance agencies and national organizations have programs related to tropical forest resources, the number of international organizations doing significant work on tropical forest resource technologies is much smaller. Five international organizations that have important potential for develop-

ment and dissemination of technologies that can sustain the forest resources are briefly described here.

## Consultative Group on International Agricultural Researeh (CGIAR)

CGIAR is an association of 13 international or regional research centers concerned with increasing the quantity and quality of food supplies. CGIAR also organizes conferences and training courses and disseminates information. Established in 1971, it has a secretariat based at the World Bank and a technical advisory committee located at FAO. The secretariat coordinates with donors and channels funds to the centers. The total budget for the CGIAR centers exceeded $120 million in 1980.

The CGIAR centers are:

1. International Center for Tropical Agriculture (CIAT), Colombia.
2. International Center for the Potato (CIP), Peru.
3. International Center for the Improvement of Corn and Wheat (CIMMYT), Mexico.
4. International Board for Plant Genetic Resources (IBPGR), Italy.
5. International Center for Agricultural Research in the Dry Areas (ICARDA), Lebanon.
6. International Crops Research Institute for Semi-Arid Tropics (ICRISAT), India.
7. International Food Policy Research Institute (IFPRI), U.S.A.
8. International Institute of Tropical Agriculture (IITA), Nigeria.
9. International Laboratory for Research on Animal Diseases (ILRAD), Kenya.
10. International Livestock Centre for Africa (ILCA), Ethiopia.
11. International Rice Research Institute (IRRI), Philippines,
12. International Service for National Agricultural Research (ISNAR), The Netherlands,
13. West Africa Rice Development Association (WARDA), Liberia,

CGIAR centers could expand into forestry research. By increasing the productivity of food crops, CGIAR research has the potential to reduce land conflicts between agriculture and forestry. However, CGIAR'S commodities approach and emphasis on input intensive methods might not be relevant to forestry. In addition, CGIAR has not shown much interest in expanding into forestry; it rejected the Council for Research on Agroforestry's (ICRAF) request for associated status in the CGIAR network (4).

## Food and Agriculture Organization of the United Nations (FAOI

FAO, headquartered in Rome, has the largest concentration of tropical forestry expertise in the world. It also has a large number of specialists on assignment in tropical countries. It is important to note that the FAO Forestry Department is dwarfed by the size of the FAO Agriculture Department. Forestry receives less than 8 percent of FAO'S total funding, and FAO Agriculture Department publications seldom evidence concern for the relationships between agriculture and forestry. Nevertheless, agriculture and forestry are interdependent, so the agriculture activities of FAO are of critical importance to forest resources.

FAO'S Forestry Department is divided into four programs. In decreasing order of size, they are: 1) Forestry Investment and Institutions, 2) Forest Industries and Trade, 3) Forest Resources and Environment, and 4) Forestry for Local Community Development. A Forestry Policy and Planning Service sets overall priorities.

FAO'S primary mission is technical assistance, not research or implementation of development projects. It compiles an annual yearbook of forest product statistics and, in conjunction with UNEP, has assessed tropical forests resources and deforestation rates (ch. 3). FAO also has a mandate to support a tree seed bank system, but this has not progressed very far. FAO'S Investment Centre assists the

World Bank and the regional development banks in appraising projects. Nearly all forestry projects of the United Nations Development Programme are implemented through FAO'S field units.

Although FAO responds to country requests, it also sets priorities for assistance. Current priorities of the Forestry Department include creating a world forest resources information system; improving techniques for the establishment and management of plantations; developing upland forests for erosion control and watershed management; promoting wildlife and park policies; monitoring and evaluating social forestry projects; identifying ways to generate more income from processing wood and nonwood forest resources; and facilitating education, training, and institution building in developing countries. FAO has recently decided to revitalize its Committee on Forestry Development in the Tropics and is expected to use more of its resources for tropical forest conservation and development.

### International Council for Research in Agroforestry (ICRAF)

ICRAF is a relatively small organization (about 15 professionals) headquartered in Nairobi, Kenya. Its budget is only one-tenth of the budget of individual CGIAR institutes. But it is the only organization with a mandate to work globally to stimulate, initiate, and support research for development of sustainable agroforestry land-use systems. ICRAF'S multidisciplinary team of scientists conducts its own research and trains people from a wide variety of disciplines and organizations in the developing world. In addition, it collaborates with other developing nation institutions on research and development projects. Its long-term program involves: 1) developing interdisciplinary capacity and methods to assess constraints in land-use systems and to identify agroforestry solutions, 2) collecting and evaluating existing agroforestry knowledge, and 3) establishing a program for disseminating information about agroforestry.

ICRAF is governed by an international Board of Trustees and is independent of all other supranational bodies. It receives its operational funds from bilateral donor agencies and private foundations. AID and Canada's International Development Research Center are among the main donors to ICRAF. Since ICRAF is considered a forestry organization, it is not a member of CGIAR, whose mandate does not include forestry. However, ICRAF has indicated that it should be considered an organization developing technologies for use on agricultural as well as forest land.

### International Union of Forestry Research Organizations (IUFRO)

IUFRO, based in Vienna, is a loosely knit association of some 600 research organizations involving some 10,000 researchers from 89 countries (3). It does not conduct research but helps to disseminate findings. It sponsors the World Forestry Congress every 3 to 5 years, regional workshops, and a quarterly newsletter. Other than these activities, IUFRO'S role has been limited because its funding levels are low. IUFRO is a very decentralized organization, mostly dependent on voluntary cooperation (18). IUFRO is concerned with six main areas of research: 1) forest environment and silviculture; 2) forest plants and forest protection; 3) forest operations and techniques; 4) planning, economic growth, and yield; 5) management and policy; and 6) forest products.

In mid-1983, a research coordinator post was established at IUFRO headquarters. In 1984, IUFRO will sponsor four regional planning workshops on forestry research and technology transfer. These include fast-growing tree species in Asia, fuelwood production systems in Africa, and multipurpose tree species for reforestation of degraded lands in Latin America. The total funding for these research coordination efforts is low.

### United Nations University (UNU)

The UNU, chartered in 1975 under the joint sponsorship of the U.N. and UNESCO, was

created to be an international community of scholars engaged in research, post-graduate training, and dissemination of knowledge. A central program and coordinating unit is based in Tokyo, but UNU activities take place throughout the world. It does not offer degrees. UNU has never received funds from the U.S. Government.

The university has three principal programs: Natural Resources, Human and Social Development, and World Hunger. In each of these areas, the UNU performs five major functions:

1. to identify and define pressing global problems that can be alleviated through research, advanced training, and dissemination of knowledge;
2. to help fill gaps in knowledge and expertise through internationally coordinated research and advanced training;
3. to strengthen research and advanced training resources in developing countries;
4. to make information available to scholars and research results available to decision-makers in usable form; and
5. to encourage mission-oriented, multidisciplinary research and advanced training.

The UNU functions through networks of existing universities and research institutes around the world and provides participants with access to a variety of courses, instructors, and research facilities. Special emphasis is placed on interdisciplinary research and training and on disseminating information to international organizations, governments, scholars, policy makers, and the public. UNU has supported research relating to agroforestry ($200,000 per year, primarily in cooperation with C.ATIE), fuelwood consumption and supply, and land use in arid and semiarid regions.

## THE ROLE OF THE PRIVATE SECTOR

Historically, the greatest involvement of U.S. interests in tropical forests has been in the private sector, U.S.-based commercial firms have had forestry operations in tropical regions at least since the early 1900's. The value of tropical hardwoods (logs, lumber, plywood, and veneer) imported into the United States totaled $537 million in 1978. U.S. demand for tropical hardwood sawtimber is expected to increase dramatically over the next two decades. Also, because of the longer growing seasons and faster growth rates possible in tropical forests, the U.S. paper industry is expected to begin using wood from the Tropics for its processes as well.

The extent of private sector involvement in the Tropics has varied because each firm has its own perceptions of its needs and of the current and future economic climate. A few U.S. firms specializing in use of primary resources (e.g., timber or minerals) have contributed substantially to developing technologies for the Tropics and have played an important role both by providing capital for development and by transferring technologies.

Of all U.S. organizations, the U. S-based multinational forestry corporations have had the most to offer and the most to gain in ensuring that tropical forest resources are maintained, These companies are a great storehouse of information and experience in managing forests. Much of this experience was acquired in the temperate zone, but technical know-how can be adapted and transferred in such fields as nursery and seed orchard establishment, tree improvement, pest control, fertilization, silviculture programs, harvesting, transportation, and wood product processing.

Although U.S. forestry companies with operations in tropical nations have in the past concentrated on producing sawlogs and veneer logs, some have recently begun applying their expertise to managing the forests within their concessions for production of a wider range

of products and sustainable yields. At least 23 U.S.-based forestry firms (table 16) have operations in the Tropics. About half of these have active forest concessions; the others are involved in pulp and paper operations, research, or have simply setup offices to explore the feasibility of establishing operations in the tropical country (l).

The extent of future investments in the Tropics by U.S. firms is uncertain. Opportunities exist for transfer of both technical and business skills. In some ways, tropical areas have a comparative advantage because they have longer growing seasons. But this is countered by higher infrastructure and transportation costs. Although labor costs are lower in the Tropics than in the United States, it can be difficult to find skilled workers for forest industries.

**Table 6.—U.S. Forestry Firms Operating in Tropical Countries, 1981**

| |
|---|
| 1. Balsa Ecuador |
| 2. Boise Cascade |
| 3. Crown Zellerbach |
| 4. Champion International |
| 5. Container Corp. of America |
| 6. Continental Forest Products |
| 7. Ford International |
| 8. Gould Paper |
| 9. Georgia-Pacific |
| 10. International Paper |
| 11. International Balsa |
| 12. John Miles Co. |
| 13. Kimberly Clark |
| 14. Olinkraft |
| 15. Pascagoula Veneer |
| 16. Robinson Lumber |
| 17. Resources International |
| 18. Scott Paper |
| 19. Sonoco Products |
| 20. St. Regis |
| 21. U.S. Plywood/Champion |
| 22. West Virginia Paper Co. |
| 23. Weyerhaeuser |

SOURCE: J. Bethel, et al., *The Role of U.S. Multinational Corporations in Commercial Forestry Operations in the Tropics*, University of Washington, report for the U.S. Department of State, 1982.

The main obstacle to increased U.S. investment, however, is the political and economic situation in tropical countries. Some countries restrict the share of foreign capital in domestic enterprises, have unfavorable tax or monetary policies, have institutionalized corruption, or involve high risks due to potential economic instability,

Other private industries could also make important contributions to maintaining tropical forest resources. The development of unconventional energy sources could affect tropical forests. Biotechnology firms are improving food and tree crops through tissue culture and other propagation techniques. In the past, some pharmaceutical firms conducted systematic studies of exotic flora for compounds of pharmacological interest (11). Such programs added to the knowledge of tropical ecosystems and provided new, useful substances. Now, however, plant screening is seen as less productive than chemical synthesis of new compounds. Today there are no U.S. pharmaceutical manufacturers involved in a research program designed to discover new drugs from higher plants (6) and the major program, begun by the National Cancer Institute in 1956 to screen plants for antitumor activity, was terminated in 1981.

## CONSTRAINTS

### Lack of Funds

Constraints on tropical forest resources development occur at various levels: within development assistance organizations, within the recipient countries, and within the local recipient communities. A constraint often cited at all levels is lack of funds. More money, it is so often argued, will bring more results. This is heard from the field, from project designers, and from the organizations themselves when soliciting support from their governments or contributors.

Forestry is a relatively cash-starved sector in many countries where forests do not generate large foreign-exchange earnings. The slow growth of forests compared with the produc-

tion of annual crops or manufactured goods makes forestry investments seem relatively unprofitable. Even in wood-exporting countries, concession fees and excise taxes 011 commercial products are often so low that the government does not obtain much profit from forest exploitation. Consequently, finance and planning agencies in tropical countries tend to neglect forestry, Even the multilateral development banks provided little financing for efforts to sustain forest resources until just a few years ago.

Moreover, projects often are left unfinished or without proper followup because funding beyond initial budget commitments is inadequate. This deterioration of projects over time occurs because donors fail to recognize the long-term nature of forestry activities (24). Within countries, it is often easier to start a new project than to secure funds to continue one. Thus, it may be appropriate for development assistance agencies to plan fewer projects but to continue support for longer periods (8),

The problem is, of course, that the current economic climate makes it exceedingly difficult to obtain increased or new funds. Many legitimate development issues needing financial support must compete for a limited resource—money. Thus, while continuing to seek additional financial support organizations also need to search for more innovative and effective ways to use the forestry and agroforestry funds they have.

## Lack of Knowledge About Resources and Adequate Technologies

Tropical ecosystems are extremely complex. Further, forest resource problems—and their solutions—are commonly site-specific, Although some basic knowledge about the structure and functions of tropical forests has been known for decades, the kinds of information needed to analyze long-term effects of various management schemes are not available. Thus, site-specific research on biotic resources, soils, and hydrology is needed to plan action that can sustain land-use conversions, maintain the resilience of forests, exploit the wide variety of

### Obstacles to Effectiveness of Organizations Involved in Forestry Activities in Developing Countries

- Few donors are involved in forest conservation activities, probably because conservation projects often are not profitable,
- A number of donor projects are contributing to deforestation or will fail in reducing the problem because inadequate attention is paid to ecological effects, Road building, agriculture, hydroelectric dams, colonization, and industrial forest harvest projects can be causes of deforestation.
- Donor agencies operating in the same country tend not to communicate with each other. This leads to duplication of efforts or failure to learn from the mistakes and successes of others.
- Forestry projects are often imposed on local residents rather than being based on what the community wants and needs. As a consequence, many donor projects fail because of “lack of cooperation” from local residents.
- Donor organizations often exhibit little acceptance or understanding of the value systems, cultures, and traditions of the recipient countries in the design and implementation of forestry projects.
- It is possible to create a negative impact by flooding a country with excessive donor activities or funds. Donor organizations may implement oversized projects in countries riot yet ready to absorb them into their existing political and economic structure. Often, when project funding has ended, the country is ill-equipped to carry on because of bottlenecks in education, managerial talents, and other factors.
- Projects are often started but left unfin-

forest products, and reduce or mitigate offsite impacts.

Many experts believe that the major constraints on sustained use of tropical forests are institutional, social, and political, not technical. They argue that adequate techniques to manage natural forests and plantations, reforest degraded lands, and sustain agroforestry already exist. (Some techniques to reforest degraded lands, for example, are reviewed in OTA Background Paper #1, ***Sustaining Tropical Forest Resources:*** Reforestation ***of Degraded Lands.)***

Why, then, are these techniques not widely in use? One possibility is that although they are technically feasible, they are not economically attractive. Many of the techniques have not been suitably adapted for developing nations. They are often capital intensive, require heavy or specialized machinery, highly skilled labor, or continuous inputs of imported chemicals—any one of which can make a technology inappropriate. Additionally, poorly understood social or cultural factors often impede technology transfer. Thus, many organizations' efforts to develop forest resources fail to spread beyond the bounds of pilot project areas because the knowledge needed to make the technologies more attractive does not exist or has not been communicated to the project implementors.

## Political, Cultural, and Institutional Constraints

Many organizations' efforts are constrained by social factors. Political commitment is often lacking within development assistance organizations or within the counterpart tropical government organizations to allocate more staff and funds to:

- conduct the necessary, long-term baseline ecological and social research;
- provide ecologically sound support for local populations during the lag between investments in trees and realization of the benefits;
- Ž provide necessary, continuous evaluation of projects so that they can be improved as needed; and
- work to meet the needs of local populations.

Forestry projects imposed "from the top down" without adequate community participation commonly fail.

How these constraints affect organizations varies depending on the organization and its purposes. The effectiveness of regional and international research organizations can be greatly constrained where local organizations to adapt technologies to local conditions are lacking. In some cases, capable local organizations do exist but are under political constraints that limit their communication with international groups.

National governments' attitudes toward tropical forest resources are often a major constraint on investment to sustain the resource base. Forestry concessions are often viewed just as revenue-raising devices rather than also as forest management tools. Political leaders who may be voted out of office or deposed rapidly often have a short planning horizon, viewing forest land as a commodity rather than a resource. Or some special interest may be able to get sizable short-term profits from destructive use of tropical forest resources. Legislation is needed to promote integration of forestry and land-use planning, but only a gradual education process can assure government backing for such policies.

## Lack of Communication

One constraint often emphasized is inadequate communication. Resource development suffers when researchers or field staff do not communicate with each other, when project planners do not communicate with recipients, and when donor agencies do not communicate with other agencies. And prospects for sustained resource development are dim when projects do not complement one another as sequential steps in an overall strategy. But im-

proving communications and coordination is more difficult, and more expensive, than might be expected. Distribution of timely information, especially when the most important audience is in developing countries, can face many obstacles, both logistical (delivering information to appropriate recipients) and human (finding appropriate readers and inducing them to read and use the information).

Encouraging donor agencies to communicate and coordinate with each other should be a less formidable task, but in reality it is not. First, there are a great number of national, international, regional, and local institutions to track. Many agencies simply do not have the capacity to do this. Communicating with other agencies is often seen as an inappropriate infringement on staff time simply because interagency coordination is seldom an explicit objective in agencies' policies. In some cases, donor organizations compete with each other for influence and thus avoid communication. More often, there are simply too many other things for an organization to accomplish with limited staff and funds,

### Contradictory Efforts

There is a lack of consensus and unified policy on how to reconcile economic development of tropical forest resources with the need to preserve biological diversity and other nonindustrial forest functions. This sometimes leads to organizations working at cross purposes. At times contradictory efforts are accidental; one donor agency simply may not know what other agencies are doing. Occasionally an organization's own efforts can seem confused—one branch financing a reforestation project while another finances the conversion of undisturbed forest into agricultural land.

Sometimes such apparent conflicts are the inevitable result of different organizations having different goals. For instance, the CGIAR institutions strive to increase and promote agricultural production and expansion. The expansion often occurs at the expense of forests and in conflict with organizations that are working to prohibit agricultural clearing on forest lands that cannot sustain it. In times when development funds seemed more plentiful, coordination of effort may have been less important. But today coordination is essential to assure efficient use of existing funds and staff.

## OPPORTUNITIES

The constraints discussed in the previous section are not insurmountable. Some of the leading multilateral such as World Bank and FAO have begun to shift their forest development priorities from nearly total emphasis on industrial forestry to community forestry, agroforestry, and institution building. While there is criticism that implementation of these new priorities has lagged (24), the shift in policy is an important beginning. Several strategies exist to further improve the capabilities of organizations that develop, transfer, and implement technologies to sustain tropical forest resources.

### Greater Cooperation Between U.S. Government Agencies

Because tropical forestry is peripheral to the interests of U.S. organizations, the U.S. expertise on tropical forests is widely scattered (13), No one organization can assemble an adequate team for tropical forest resource development from its own staff. However, cooperation be-

tween organizations can be fruitful. Two of the most productive cooperative agreements are the Forestry Support Program and the Forest Resource Management Project.

The Forestry Support Program is a joint effort of AID, Forest Service, and the Office of International Cooperation and Development. It provides forest service personnel to help AID in designing, managing, and troubleshooting field projects in forestry and natural resources. It maintains detailed files on hundreds of U.S. forestry and natural resources experts. It provides general forestry information and facilitates exchanges of technical information among natural resource personnel on AID and Peace Corps projects. Evaluation of the program has indicated that it has substantially enhanced the cost effectiveness of AID's development assistance efforts in forestry (5).

The Forest Resource Management Project, in which the Peace Corps and AID collaborate, has assessed forestry activities for many tropical nations, conducted regional forestry programing workshops for AID, Peace Corps, and ministry staff in several countries, conducted pre-service and in-service technical training programs, and initiated several modest reforestation pilot projects. The Peace Corps efforts have been funded by AID and given technical support from the Forestry Support Program.

Several existing laws can be used by U.S. agencies to transfer staff and resources and increase the coordination and cooperation of U.S. Government agencies in development assistance. The Foreign Assistance Act (22 U.S.C. 2357(a)) provides several mechanisms for interagency cooperation. Temporary duty assignments (TDY) can be arranged for specific tasks up to 6 months. Participating Agency Services Agreements (PASA) are for time-specific, reimbursable exchanges of staff for up to 2 years. Resources Supply Services Agreements (RSSA) allow for other types of reimbursable cooperation. Cooperative agreements allow exchanges of staff and resources between agencies without charge. The Government Employees Training Act (ch. 41, Title 5 U. S. C.) and the Economy Act (31 U.S.C. 686) also provide authority for reimbursable cooperation between Federal agencies. Although AID has some agreements of this sort with other Federal agencies, the full potential of their use in foreign assistance activities has not been realized (22).

## Redirecting International Organizations

Multilateral development banks and some U.N. agencies provide capital and technical assistance for forest resource development. But their forestry efforts are small relative to their other rural development programs. Further, the unplanned impacts on forests of other projects may well be greater than the effects of the forestry projects. Some development projects contribute directly to deforestation—for example, large hydroelectric plants, extensive cattle ranches, and resettlement schemes based on unsustainable agriculture (2). Although the multilateral development banks have signed a joint "Declaration of Environmental Policies and Procedures Relating to Economic Development, " little has yet been done to include comprehensive environmental assessment in the project planning process (12).

Through existing mechanisms, the United States has considerable influence over activities of multilateral development banks and U.N. agencies. However, the United States has not fully exercised its influence to promote projects that sustain renewable resources and to avoid projects that harm long-term resource productivity. Doing so would have a significant effect on tropical governments. Countries often are able to obtain substantial cofinancing from other sources for activities supported partly by multilateral development bank loans. Thus, governments can be motivated to modify their development policies to harmonize with those of the development banks.

Some actions that U.S. representatives to the multilateral banks and U.N. agenices could promote include:

- instituting environmental impact assessment procedures,

- improving monitoring and evaluation of projects for their environmental impacts,
- increasing environmental staff and budgets,
- reporting environment-related activities annually, and
- removing restrictions on information about projects-to allow greater outside scrutiny and accountability (19).

The mechanisms for accomplishing these reforms differ for each multilateral development bank and U.N. agency.

### U.S. Representation To the Multilateral Dovelopment Banks

The U.S. Treasury Department's Office of Multilateral Development Banks oversees administrative budgets and policy papers for the multilateral development banks. It also evaluates loans on the basis of legislated, political, and economic concerns. The predominant concerns are human rights and the production of citrus, sugar, and palm oil that could affect U.S. producers. Most of the office's work is in reviewing the projected economic returns of loans. Recently, this office sought advice from U.S. embassies on loans in their respective countries.

The United States has representatives on the boards of directors of the multilateral banks. Voting rights are allocated in proportion to each nation's contribution to the bank's budget. The United States has 19 percent of the total voting power on the World Bank's Board, 5 percent at the African Development Fund, 13 percent at the Asian Development Bank, and 35 percent at the InterAmerican Development Bank. However, a formal vote is rarely taken because decisions on projects generally are made by consensus. A country can push to have formal votes recorded. Ordinarily, problem projects are simply blocked from reaching the agenda. In 1982, the U.S. Government opposed 17 projects proposed by the banks. The multilateral development banks can fund only those activities requested by governments; however, the banks can impose conditions on project implementation in loan agreements.

### U.S. Represenation to U.N. Agencies

The International Development Cooperation Agency (IDCA) establishes the overall budget and policies for U.S. participation in UNDP, FAO, WFP, UNEP, UNESCO, UNICEF, OAS Technical Assistance Funds, U.N. Capital Development Fund, U.N. Educational and Training Program for Southern Africa, and the U.N. Disaster Relief Organization. The State Department's Office of International Organizations and Programs has lead responsibilities relating to several U.N. agencies.

The United States maintains permanent representatives to the U.N. agencies and has special delegations who present U.S. policy positions and vote on specific country programs. Like all other countries, the United States has only one vote on the governing boards of U.N. agencies. However, the United States can exercise considerably more influence due to its budget contribution. Until recently, UNDP'S Governing Council voted on particular projects. Now these decisions have been decentralized and the U.S. representatives no longer even receive copies of project documents routinely. The FAO/UNEP Committee on tropical forestry is another vehicle by which the United States can participate in setting the priorities of these two organizations.

One way of increasing the role of U.S. experts is to begin participating in the U.N. Associate Experts Program. Under this program, the U.S. Government would pay the salary costs of sending U.S. technical personnel to developing countries to work on U.N. agency projects.

### Increasing Coordination Among the United States, Other Bilateral Donors, and Multilateral Aid Agencies

Coordination among the United States, other bilateral donors, and multilateral aid agencies can be improved. One vehicle for such coordination is the Development Assistance Committee (DAC) of the Organization for Economic

Cooperation and Development (OECD).* DAC undertakes "Annual Aid Reviews" on the volume and terms of assistance. Few agreements have been reached through DAC, and those that have are not binding or are vague (14). Nevertheless, DAC provides a forum for exchanging ideas. It has encouraged some countries to establish new programs and change existing ones.

U.N. agencies seem to be appropriate organizations for international coordination. The U.N. Commission on Trade and Development has made efforts to coordinate but these have led to confrontation rather than constructive problem-solving. The U.S. Department of State believes that FAO is best suited to coordinate the international forestry activities that are not country-specific (8). However, AID does not aggressively seek FAO coordination of its forestry efforts.

Coordination also needs to be improved at the country programing level. Such programing should involve the preparation of multiyear plans by the recipient countries or ad hoc committees of donors so that the various donors can support complementary projects. With such planning the development assistance agencies would not compete for host country experts or other resources. Through DAC, the United States has advocated greater use of country programing since the early *1960's (14),* arguing that it would result in more cost-effective development assistance. In the simplest model, each donor would proceed separately after obtaining a coordinating organization's agreement on a project. However, another possibility would be for several donors to combine resources and expertise on joint projects.

Successful coordination requires: 1) active interest and participation of the donors and the recipient countries; 2) good planning capability; and 3) strong leadership (8). In practice, securing cooperation is not easy. Donors are often reluctant to change plans to conform to those of a coordinating organization. If a foreign or multilateral organization attempts the coordination role, recipient countries may feel that their sovereignty in negotiating with the donors is being compromised.

Some attempts have been made to coordinate country programing for forest resource development. Nepal has tried to designate a lead donor for particular types of projects in certain regions of the country, but this has not been accomplished. Honduras has a Governmental Department of International Coordination, but this has done little to improve coordination because the Department only reviews projects after they have been approved by the various implementing agencies (8).

In response to pressing problems in one region of Africa, the Club du Sahel was established in *1976* by donors in Paris. The United States provides some participants to this group. An African group, the Interstate Committee for Drought Control in the Sahel (CILSS) also works in this area. Enlisting the cooperation of donors and recipient countries was made easier by the crisis situation in the Sahel.

Cooperation for Development in Africa (CDA) is an informal group of bilateral donors established in *1982* at the initiative of France. The participants include the United States, Belgium, Canada, France, Germany, Italy, the United Kingdom, and numerous African nations. The multilateral development banks do not participate officially but may send observers to CDA meetings. CDA consists of ad hoc committees of representatives organized to address particular development topics. The United States is the lead donor nation for the committee on forestry and fuelwood. The committees discuss the types, location, and timing of projects. They do not undertake directly to exchange information on technologies or evaluate lessons learned during projects. CDA also is making an effort to find activities that are too large for a single donor to take on but are appropriate as joint development assistance ventures.

The CDA Forestry and Fuelwood Technical Committee takes a national focus, not a region-

*OECD member countries are Australia, Austria, Belgium, Canada, Denmark, Greece, Iceland, Ireland, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States. Yugoslavia has special status.

al one. It initially operates in only five countries—Burundi, Malawi, Senegal, Somalia, and Upper Volta—in order to demonstrate the workability of the process (10). Criteria for selecting countries include: 1) commitment of the country to coordination of assistance, 2) potential for success, 3) need, and 4) existing multiple CDA-donor programs. The committee plans to add Mali and the Sudan and to consider inclusion of Cameroon and Kenya (4). More African countries are involved in other CDA technical committees.

The CDA process is well under way in Senegal and Somalia, where it has been successful because of government commitment. The process does take staff and resources from both donor and recipient country agencies. It has not been so successful in Upper Volta, which is so flooded with development projects that it is unable to implement them well. Upper Volta also lacks a national forestry plan. In Burundi and Malawi, the process is barely under way, but appears to be working. There have been no major problems in CDA donor competition (4).

## Greater Reliance on NG0s and Universities

In the past few years, U.S. AID has channeled an increasing amount of money through nongovernmental organizations (NGOS) in tropical countries, especially through private voluntary organizations. This appears to be an effective way to promote technology transfer. NGOS offer particular advantages for small-scale and innovative projects, since in some cases they can act with greater speed, more midproject flexibility, or more public confidence than government agencies. Grass roots environmental movements within tropical countries also may deserve increased international support. Some development assistance programs explicitly exclude NGOS while others do not exclude but still underuse them.

U.S. NGOS could be made more effective by using the Intergovernmental Personnel Act (IPA) of 1970 (ch. 33, Title 5 U. S. C., subch. 6) to arrange exchanges of personnel for up to 2 years between Federal agencies and universities or nonprofit research organizations. Some U.S.-based NGOS are eligible for IPA exchanges, but transfers of U.S. Government personnel to NGOS are uncommon. The Office of Management and Budget (OMB) has recommended that IPA arrangements with universities be limited to tenured faculty, but this seems likely to have detrimental effects on the availability and development of U.S. expertise to solve forest resource problems.

The Foreign Assistance Act (22 U.S.C. 2357(a)) allows Federal agencies to provide training to: 1) personnel or sponsored fellows of international organizations in which the U.S. participates, 2) certain quasi-public organizations such as the Red Cross, 3) voluntary nonprofit relief organizations approved by the Advisory Committee on Voluntary Foreign Aid, and 4) personnel of foreign governments.

Fulbright Grants provide opportunities for faculty members from U.S. universities to teach, study, and conduct research in developing countries and for scholars from developing countries to work in the United States. This program could make a greater contribution to the development and transfer of tropical forest resource expertise. However, the Fulbright program has been cut back sharply in recent years.

AID has given one strengthening grant to a U.S. university to expand its international forestry capability. This is a 5-year matching grant of $100,000 per year with the University of Idaho. There are no plans to award similar grants to other universities in forestry. In comparison, AID has some 50 strengthening grants with U.S. universities in agriculture.

## Encouraging Responsile Involvement by Private Corporations

The private sector can be an effective technology transfer agent and could play a more important part in efforts to develop and implement technologies to sustain tropical forests. The U.S. Government has established three programs to increase the involvement of the private sector in fostering development: 1)

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Overseas Private Investment Corporation, 2) Trade and Development Program, and 3) International Executive Service Corps. However, none of these programs has been used very much in the forestry sector.

### Overseas Private Investment Corporation (OPIC)

OPIC, established in 1971, provides services to U.S. companies interested in investing in the private sector in developing countries. These services include: 1) information on investment opportunities; 2) financial assistance for investment missions, feasibility studies, and market research; 3) insurance for political risks; and 4) loans or loan guarantees. The eligibility criteria for assistance include per capita incomes in the host country; size of the participating business and its degree of involvement in the venture; economic and technical soundness of the proposal; and the contribution of the business to the economy of the host country. Environmental factors are also supposed to be considered. Forestry and biotechnology enterprises can be eligible for OPIC assistance.

### Trade and Development Program (TDP)

TDP, established in 1980 under IDCA, aims to increase the exports of goods, services, and technology by U.S. firms to governments in less developed countries. The principal activities of TDP are: 1) sponsoring project identification and feasibility studies, 2) organizing technology workshops, 3) coordinating technical assistance from various U.S. Government agencies to foreign governments, and 4) administering technical training programs in the United States for foreign citizens. The latter two activities are on a reimbursable basis. TDP seeks reimbursement of the costs of feasibility studies from the investors if the project proceeds and it also tries to obtain some cost-sharing by the host countries.

The criteria for selection of TDP activities include: 1) consistency with the development priorities of the host country, 2) availability of funding for project implementation (other than AID), 3) friendliness of the host country to the United States, and 4) export potential of implemented projects.

### International Exeutive Service Corps (IESC))

IESC makes the expertise of volunteer retired executives available to developing countries. IESC gives priority to assistance for small and medium businesses; services to governments are deemphasized. U.S. AID provided $5 million to IESC in fiscal year 1982, slightly over half of its funding. The rest comes from U.S. corporations.

## Strengthening Existing Organizations

Foremost among opportunities to strengthen existing development assistance organizations would be to continue and expand support for forestry efforts by AID. AID has a clear mandate from the U.S. Congress to develop and strengthen "the capacity of less developed countries to protect and manage their environment and natural resources" (sec. 118 of the Foreign Assistance Act) with explicit authorization for assistance to "maintain and increase forest resources" (sec. 103 b). In 1981, section 118 was further amended to express congressional concern "about the continuing and accelerating alteration, destruction, and loss of tropical forests in developing countries. "

AID could emphasize this policy mandate, translating it more often into action. This could include continuing education for AID personnel regarding the relevance of forestry concerns. More project designs could allocate a percentage of funds to relevant environmental protection measures—for instance, water development projects could include components to maintain forest cover on surrounding watersheds. Many of the development activities AID conducts have direct and indirect impacts on tropical forests, and AID does sometimes include forest-related components on projects not specifically aimed at forest development.

Another way AID could enhance its effectiveness in this sphere is through the Food for

Peace program. AID administers some $1.6 billion per year in Public Law 480 Food for Peace activities, but now only about 1 percent of the projects are concerned with forest resources. More of these funds could be directed to reforestation and assuring local involvement in forest and plantation management. Public Law 480 foreign currency reserves could also be used to fund forest research, perhaps including a greater involvement by the U.S. Forest Service.

This redirection of existing efforts is a way to increase U.S. involvement without adding new financing, although substantial increases this way could lead to reductions elsewhere. The international programs of U.S. Government agencies other than AID also could be expanded to play a more active role in sustaining forest resources. The U.S. Fish and Wildlife Service, the Forest Service, and the National Park Service, for instance, have much relevant expertise and could be encouraged to increase their international work.

Research sponsored or financed by the U.S. National Science Foundation (NSF) and the National Academy of Sciences (NAS) has provided important support to AID and other organizations that work to sustain tropical forest resources. These two agencies could be encouraged to intensify their work on important international environment issues.

Another opportunity to strengthen existing organizations concerns the UNESCO Man and the Biosphere (MAB) program. MAB has supported some 1,000 field projects in 90 countries. Nearly one-fourth of its $2 million *1981-83* budget is for activities related to humid tropical zones and MAB has a commendable record of supporting innovative research on tropical forest resources. It has a good international reputation and has been successful in supporting small-scale and pilot project research. UNESCO is the organizing agency for MAB, but each country's effort is funded independently. U.S. support for MAB has been diminishing and much of the U.S. contribution now comes from the Forest Service and the Department of State. The proposed fiscal year *1984* budget contains no funds for MAB.

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