

## **Problems Facing Tropical Forests : The FAO's Response**

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### **Introduction**

FAO is very pleased to be here today for this important occasion in which foresters and agriculturists are convened to discuss the rehabilitation of degraded forest lands. As correctly stated by the organizers of this symposium, deforestation and degradation of tropical forest lands are proceeding at a rapid pace worldwide. Major challenges that lay ahead are not only in ensuring that lands best suited to forests remain under forests and the levels of degradation are minimized, but in rehabilitating degraded forest areas. To meet these challenges, the need is clear for agriculturists and foresters to work together in the context of integrated land use planning. The two disciplines have much to offer one another, in questions of land use in the interface between forests and agricultural lands, as well as of the appropriate role of agriculture in forest lands and, conversely, of forestry in agricultural lands. The integration of forestry and agriculture, such as through agroforestry systems or reafforestation on degraded forest lands, can offer much to the restoration of environmental services once offered by the forests, to the improvement of the land's productive capabilities, and to the amelioration of living conditions of rural dwellers.

FAO, the technical organization of the United Nations for agriculture and forestry, has been asked to speak on the major problems facing tropical forests and outline its activities related to these. This paper, therefore, outlines the status of tropical forests worldwide; causes of deforestation and degradation; and, in general terms, the needs and problems related to sound management of these forest lands. Finally the role of FAO in this area is discussed.

### **The extent and causes of deforestation and degradation of tropical forests**

The preliminary results of the FAO Forest Resources Assessment 1990 show that 16.9 million ha of closed and open forests were cleared annually in tropical countries during the 80s, at a rate of 0.9% per year (see Table 1). This is to be compared with the estimate of the deforestation rate during the late 70s of 11.3 million ha (or 0.6%) per year, as cited in the 1980 Forest Resources Assessment. Even taking into account differences in estimation procedures and in the level of accuracy between the data supplied for the 1980 and 1990 assessments, these two figures confirm what is obvious in many tropical countries: that clearing of tropical forests continued to increase during the 1980s.

The vast majority (80-90%) of deforestation in the tropics is attributable to the horizontal expansion of the agricultural frontier in the forms of subsistence shifting agriculture (in 1980 estimated to account for 45% of total deforestation), livestock ranching (particularly in Latin America), cultivation of cash crops, colonization and transmigration programs. The remainder of deforestation is the result of infrastructure development and of the ultimate states of various degradation processes.

Degradation and deforestation are closely linked. Degradation of forest ecosystems is represented by a more gradual reduction of their biomass, productive capacity and biodiversity. Continued degradation

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**Table 1 Preliminary estimates of forest area and rate of deforestation for 87 countries in the tropical regions (revised 15 October 1991)**

SUB-REGION	NUMBER CONTIRES STUDIED	TOTAL LAND AREA	FOREST	FOREST	AREA DEFORESTED ANNUALLY 1981-90*	RATE OF CHANGE 1981-90  percent per annum
			AREA 1980*	AREA 1990*		
			thousands of ha			
LATIN AMERICA	32	1 675 700	923 000	839 900	8 300	-0.9
1 CENTRAL AMERICA & MEXICO	7	245 300	77 000	63 500	1 400	-1.8
2 CARIBBEAN SUB-REGION	18	69 500	48 800	47 100	200	-0.4
3 TROPICAL SOUTH AMERICA	7	1 360 800	797 100	729 300	6 800	-0.8
ASIA	15	896 600	310 800	274 900	3 600	-1.2
4 SOUTH ASIA	6	445 600	70 600	66 200	400	-0.6
5 CONTINENTAL SOUTH ASIA	5	192 900	83 200	69 700	1 300	-1.6
6 INSULAR SOUTH ASIA	4	258 100	157 000	138 900	1 800	-1.2
AFRICA	40	2 243 400	650 300	600 100	5 000	-0.8
7 WEST SAHELIAN	8	528 000	41 900	38 000	400	-0.9
8 EAST SAHELIAN AFRICA	6	489 600	92 300	85 300	700	-0.8
9 WEST AFRICA	8	203 200	55 200	43 400	1 200	-2.1
10 CENTRAL AFRICA	7	406 400	230 100	215 400	1 500	-0.6
11 TROPICAL SOUTHERN AFRICA	10	557 900	217 700	206 300	1 100	-0.5
12 INSULAR AFRICA	1	58 200	13 200	11 700	200	-1.2
TOTAL	87	4 815 700	1 884 100	1 714 800	16 900	-0.9

\* Figures may not tally due to rounding

The differences between the present (1990) and FAO/UNEP (1980) assesments are indicated by the following summary statistics based on 76 countries in common in the two assessments:

Project	Estimated values for reference year (1980)		
	Forest area million ha	annual rate of deforestation mill ha	percent (1976-80)
FAO/UNEP (1980)	1 935	11.3	0.6 (1976-80)
Forest Resources Assessment 1990 Project	1 882	16.9	0.9 (1981-90)

of the forest resources will ultimately result in deforestation. Although the extent of degraded lands and the the level of degradation are difficult to quantify, available figures indicate that degradation is even more widespread than deforestation. Forest degradation in the humid tropics is due mainly to unsustainably high harvesting levels which are carried out in the absence of sound forest management plans or which are not in conformity with them. In the dry tropics the major causes of forest degradation are overexploitation for fuelwood particularly around cities and along roads, overgrazing and repeated bush fires.

In the humid tropics, timber logging is generally very selective (i.e., 1-10 trees per hectare); and while logging may result in degradation, it does not result by itself in deforestation. The effect of low-intensity selective harvesting largely depends on the land use which follows: if the land is left to itself, forest vegetation generally recovers, quickly forming a young secondary forest, much different in composition from the original forest. However, as is often the case, logging roads open up these forest areas, often formerly occupied by small forest-based communities, to spontaneous colonization and encroachment by migrant farmers who invade the areas. Logging may, therefore, be both a factor of forest degradation and a fac-

tor indirectly leading to deforestation.

### **The link between deforestation/degradation of forests and development in tropical countries**

In addition to recognizing the immediate causes of deforestation and degradation of forest resources, it is essential to identify and analyze the underlying, fundamental forces driving tropical forest loss and deterioration. These include the following: political instability and war; debt burden forcing governments to look for quick revenues in the short term and at the expense of sustainable management of natural resources; poverty in the rural area, including also uneven distribution of land; excessive growth of human populations and livestock beyond the carrying capacity of the natural or manmade ecosystems; weak institutional capabilities in forestry administration; and lack of adequate education, training, research and extension. In addition, traditional land and resource use practices, which were once sustainable, are breaking down in many places under demographic, climatic and social and cultural changes, which are altering the availability or quality of resources as well as the traditional means of controlling resource use.

History of forest use worldwide shows a similar pattern, although different countries are at different stages in this developmental process. In the first phase, forests are considered as a resource that is either an obstacle to national development or one to be tapped for quick economic returns; that is, a resource to be exploited without subsequent investments or inputs, or cleared altogether to give way to other land uses. Many tropical countries are presently in this phase. In the next phase, the "transitional" phase, the accumulated negative impacts on the productive and environmental functions of the forests, brought about by their degradation and destruction, stir governments to take corrective action in the form of policy, regulatory and operational measures aiming at curbing deforestation, managing sustainably the remaining forest resources and creating new ones. This transition phase is later followed by a "replenishment" phase when both the total forest area and the proportion of forests under sustainable management increase.

A few tropical countries, particularly those where the forest estate and its productive and environmental functions have already been seriously eroded have entered the transition phase and are attempting to implement sustainable forest management. The governments of other tropical countries appear committed, albeit many to a still limited extent, to take corrective measures with the support of the international community. The challenge is for nations to progress in this transition phase by applying concretely some form of sustainable forest management and for international assistance to provide appropriate support to do so. The challenge is even greater in countries with large areas of degraded forest lands or highly degraded lands in critical areas (e.g., important watersheds). They are faced with the need to rehabilitate these lands, a task that will require large inputs of financial and human resources. Unlike in areas where there are tracts of forest with low population density, here the technical solutions will be even more tempered by socio-economic factors, and in many cases the rural dweller is both the cause of degradation and answer to rehabilitation.

### **Problems hindering the sound management of tropical forest resources**

Forest management (referring to management of both relatively intact forests and degraded forest lands in need of rehabilitation) must be conceived and implemented within the context of overall land use plans aimed at reconciling existing, multiple demands on the resources. The needs are often conflicting; various sectors compete for the land and resources, for uses such as: agriculture and livestock production, industry (including those related to forest products), energy (including forest-based energy and forest land for hydroelectric dams), urbanization and infrastructure, and strict protection for environmental reasons. Only in areas with a secure forest tenure can forest management (including rehabilitation efforts) be put into practice in the longer term. Many of the failures of tropical forest management in the last thirty

years or so have their source in the fact that forest management has not been integrated into overall land use policy and planning at the national level, and into viable land use plans at the local level.

Next, the management objective of land which is to remain in forest should be clearly defined and achievable in practice. In the broadest sense, forest management deals with the overall administrative, economic, legal, social, technical and scientific aspects involved with the conservation and use of forests. Decisions must accordingly be made on the basis of what one *wishes* to do with the forest (the management objectives, e.g., the harvesting of wood and non-wood products, soil and water conservation, and conservation of biological diversity), what one *can* do (within the physical and socio-economic context), and what one *should* do (formulation of a set of activities for the conservation and use of a forest). Difficulties in achieving sustainable forest management have arisen from failures related to all three decision factors. Forest management, including efforts to rehabilitate degraded forest lands which are likely to increase in the future, will be successful only if the mistakes made in the past can be avoided.

In deciding what one wishes to do, choice of a single main objective for management (e.g., timber harvesting) has often compromised other possible objectives (environmental conservation, provision of non-wood forest products) to the detriment of sustainability. In planning the use of tropical forest lands and forest resources, governments are generally forced to give absolute priority to the satisfaction of immediate and pressing economic needs of their country and peoples, to the sacrifice of longterm sustainability. When multiple objectives are identified without prioritization, the result is often the lack of satisfactory realization of any of them. Situations where the achievement of one objective is dependent on achieving another, must also be recognized. Take for example, a case in which the objective is the rehabilitation of degraded forest lands through reforestation to be carried out by local farmers. If the common, primary objective of the farmer -- that is increasing household income (or livelihood) -- is not achieved by tree planting, the farmer will not plant trees and the objective of soil conservation will not be met. Too often, farmers have been receptive to carrying out tree planting when subsidies in one form or another are offered, but once these are removed (e.g., a project ends), the activities end as well.

In identifying what one *can* do with a forest, generally the socio-economic context has been insufficiently understood or its importance underemphasized, institutional capabilities to carry out the plans have proven to be too weak, and the technical knowledge, both of the resource base and management techniques, has been too limited.

Too often there has been a lack of capability to implement the forest management plans which have been designed. Many short-lived forest management projects have left behind systems which could work only in pilot areas with a high level of external inputs which could not be replicated in other areas. Too often, also, rights to harvest (such as in the case of state forestry operations as well as those by concessionaires) have been afforded on the basis of specific regulations and mandatory silvicultural treatments which subsequently were not applied in practice, generally for lack of sufficient means, and sometimes also for lack of a real will to have them implemented.

The feasibility and acceptability of forestry activities depend to a large extent on their compatibility with and integration into rural development programs. As the main cause of deforestation is the horizontal expansion of agriculture, activities and projects in agriculture and animal husbandry as well as in agroforestry have a bearing on the conservation and development of forests. Hence the need for dialogue and cooperation between actors at all levels in forestry, rangeland management and agriculture.

Forests are state-owned in most countries in the tropics, with some notable exceptions, such as tribal ownership in the Melanesian countries of the Pacific, or communal ownership ("ejidal") in Mexico. While this simplifies the land use planning process to some extent, the forest owner must not assume that he can (successfully) plan forest management systems without taking into consideration the forest users, or those who have traditionally used the forests for given purposes. Social acceptability of forest activities

is a subject which has received considerable attention during the last 10 to 15 years. In situations of increasing population pressure in and around the forests, no forest management or forest rehabilitation activity is likely to succeed in the long run if it has not been planned and implemented with the involvement of local communities and if it does not benefit them directly.

Adoption and strengthening of forestry institutions-national forest administrations, forestry education, training, research and extension institutions-have to be in place to support sustainable forest management and the rehabilitation of degraded forest lands.

Sustainable forest management is dependent on the development of technically sound management systems and the application of these on the ground. There is still a great need for research in natural forest management, plantation establishment and management, agroforestry and farm forestry, watershed management, the conservation of forest genetic resources, etc. One difficulty faced by tropical countries is to finance long-term research activities which may have a remote pay-off. Forestry research expenditure (1980 figures) as a percentage of the value of forest production is low: 0.02% for low income countries vs. 0.26% for developed countries (compared with 0.45% and 1.51% respectively for agriculture).

Much has been written about the need to improve forestry education and training, both in quality and scope. Forestry extension is almost universally weak in tropical countries. There is a need for agricultural and forestry extension services to collaborate in the areas of agriculture and farm forestry.

## **Needs related to improving tropical forest management : the FAO's response**

### **1 Awareness raising and information**

Priority actions include awareness raising and information generation and dissemination, aimed at politicians, technicians, the public at large, and the media. FAO's Statutory Bodies in forestry provide nations with forums in which to discuss issues and jointly focus world attention on the most pressing problems, sensitize policy makers globally or regionally on the need for joint action, and arrive at harmonious international solutions. These bodies generally subsequently report to Governments of member countries and the international community at large on technical, environmental, economic, social and institutional issues and propose concerted action for their resolution. Among FAO's 14 bodies in forestry (Table 2) the following are most relevant to tropical forest management : Committee on Forest Development in the Tropics (CTFT), regional forestry commissions, Advisory Committee on Forestry Education, and the Panel of Experts on Forest Gene Resources.

All entities concerned with the state and development of forests -- whether it be governments, international agencies, policy-makers, planners, investors or non-governmental organizations -- require an objective perspective on the status and trends of forest resources to help in the planning of use of their own resources, the supply and demand of forest products in order to understand the economic potential of forests, and the relationship between supply and demand. FAO works with countries to gather national statistics on forest area and biomass, wood energy, the production of industrial wood, and international trade in forest products. International data are published in a variety of regular FAO publications, including the "Yearbook of Forest Products", "Forest Product Prices", "Pulp and Paper Capacities", "Forest Products: the Direction of Trade", and "Forestry Statistics: Today for Tomorrow". The "Forestry Resources Assessment" projects provide important baseline data on forest cover worldwide.

### **2 Technical information and support**

FAO's Forestry Department has published and widely distributed a number of Forestry and Environment Papers dealing with technical aspects of tested proven systems of management of forests for the provision of a range of goods and services. The publications include regional reviews of multipurpose management of the tropical high forest in Africa, Asia and Latin America, and manuals on the inventory, mapping and management of mangrove forests. Similar work is planned for non-wood forest products.

Table 2 FAO STATUTORY BODIES AND THEIR MANDATES

NAME OF COMMISSION/COMMITTEE/PANEL OF EXPERTS	MANDATE
Intergovernmental bodies with global or Inter-regional mandate :	
1. Committee on Forestry (COFO) (established 1971, all member nations may attend biennial sessions, global mandate)	Review international forestry problems and propose concerted action by member nations for their resolution; review and advise on FAO's own forestry programmes.
2. Committee on Forest Development in the Tropics (CFDT) (established 1965, up to 60 member nations, inter-regional responsibilities, biennial sessions)	Review relevant international programmes and reports on harmonized collaborative international action in support of development and rational utilization of tropical forests. Monitor implementation of the Tropical Forests Action Programme.
3. International Poplar Commission (IPC) <sup>1</sup> (established 1965, 32 member nations, global mandate, meeting frequency approximately four years)	Study and promote research and exchange of ideas/experiences on poplars and willows (fast-growing hardwoods) cultivation and utilization.
4. Committee on Wood-based Panel Products (global mandate, established 1964, 26 member nations, sessions at about five-year intervals)	Study and provide advice on development of the wood-based industry.
Intergovernmental bodies with regional or sub-regional mandate :	
5-10. Six Regional Forestry Commissions <sup>2</sup> (one each for Africa, Asia-Pacific, Europe, Latin America and the Caribbean, Near East, North America)(established between 1947 and 1959, meeting frequency two to three years)	Similar functions to those of COFO but focusing on each region's particular issues.
11. Committee on Mediterranean Forestry Questions - "Silva Mediterranea" <sup>3</sup> (established 1948, meeting frequency two years)	Forestry problems of the entire Mediterranean basin.
Panels of experts and advisory committees :	
12. Advisory Committee on Pulp and Paper (established 1959) )	Review developments in their field of competence, promote exchange of knowledge, advise in the respective field, i.e., pulp and paper, forestry education and forest genetic resources.
13. Advisory Committee on Forestry Education (established 1947) )	
14. Panel on Forest Gene Resources (established 1967) )	

<sup>1</sup> Has established subcommittees on nomenclature and registration ; logging and utilization of poplar ; diseases ; insect pests ; breeding ; biomass production systems for Salicaceae.

<sup>2</sup> Several of these have established subgroups, as follows : Africa - on wildlife management and national parks ; Asia-Pacific - on forestry research and on forestry education ; Europe - on management of mountain watersheds, on forest working techniques and training of forest workers (with ECE and ILO), and on forest economics and statistics ; Latin America/Caribbean - on forestry research ; North America - on forest tree improvement, fire management, forest insects and diseases, silviculture, forest engineering, light-frame structures, multiple language vocabulary, and atmospheric deposition.

<sup>3</sup> A committee established jointly by the Regional Forestry Commissions for Africa, Europe and the Near East. Established five research networks on forest fires and particular species.

Many publications have been produced in the areas of watershed management ; arid and semi-arid forest management ; agroforestry ; plantation establishment and management ; the conservation and use of forest genetic resources ; research, education and training ; and ecologically sound forest harvesting techniques.

FAO supports a number of activities of a technical nature, some examples of which are given below. FAO, in collaboration with national or regional institutes, assists in the exploration, collection and evaluation of forest genetic resources, planning and development of seed centers, and the establishment and management of *in-situ* and *ex-situ* conservation stands of priority species.

In the area of arid and semi-arid land management, FAO supports national institutions with regard to planting techniques and operates information exchange networks with FAO's regional and sub-regional organizations. FAO also supports networks in agroforestry (in Asia and Latin America).

FAO's recent program, "Conservation and Rehabilitation of African Lands", while dealing broadly with needs for land rehabilitation, recognizes the impact of deforestation and degradation of tree and shrub cover in arid areas on the degradation of African lands and prioritizes actions for the management of forest resources and plant rehabilitation to control desertification.

### **3 Building national capabilities**

Efforts must be made in building the capability of national governments in land use planning, forest management planning and implementation of such plans. This requires a comprehensive, multi-disciplinary approach to forest land management.

The Tropical Forests Action Programme (TFAP) was born out of the global concern over deforestation and degradation of forest resources in tropical countries. The TFAP, launched in 1985, is a global cooperative effort aimed at increasing awareness of the problems of deforestation, fostering multi-disciplinary sectoral planning approaches at the national level to encourage the formulation of effective policies and programmes, and mobilizing national and international resources to support the implementation of resulting plans. While the TFAP is co-sponsored by the UNDP, the World Bank and FAO, FAO acts as the international liaison agency. Under a revised approach, broad-based participation and the improvement of country capacities in planning and implementation will be emphasized. Presently 86 countries have adopted the program : 27 countries have presented their national plans to the donor community for financing and some of these are in an active implementation phase ; 6 others are soon to present their plans ; 43 are at various stages in the planning phase ; and 10 have requested assistance to initiate planning.

### **4 Field activities**

Another priority area for action relates to "greening" : the formulation and implementation of sustainable management plans for natural forests ; afforestation and reforestation of watersheds, wastelands and abandoned agricultural lands ; establishment and management of protected forest areas with adjacent "buffer zones". All these activities must be technically viable, economically feasible, socially acceptable and environmentally sound.

FAO's Field Programme directly addresses needs such as these. The Forestry Field Programme currently comprises 267 technical assistance projects in over 90 countries, staffed by 690 experts, associate professional officers and consultants, for a total annual expenditure of US \$80 million. The largest proportion of the program is in the Africa Region (46%), followed by Asia and Pacific (24%), Near East and Europe (17%) and Latin America and the Caribbean (13%).

The most prominent ongoing forestry activities involve the assessment, management and conservation of forest resources. This often takes the form of specialized technical advice, resource surveys and plan-

ning. The latter may entail assistance in the preparation of master plans or detailed management plans for a particular forestry activity or region. Watershed management, arid-zone forestry and desert control also form parts of this category, as do projects in afforestation, wildlife conservation and national park management and restoration of degraded forest lands.

Countries also receive active support in institution-building to strengthen capabilities in administration, training, extension and research through field projects.

The most rapidly expanding category of FAO assistance includes forestry for rural development, much of it involving community forestry activities and fuelwood development. This field encompasses a number of new approaches, including people's participation to increase local production of fuelwood, fodder, poles and various nonwood tree products and promotion of appropriate forest enterprises to create jobs and generate income in rural areas. Agroforestry, community forestry and farm forestry play a prominent role in this category.

### **5 Incorporating socio-economic factors into forest resource management**

FAO's Forests, Trees and People Programme (FTPP), now in its second phase, is designed to improve the livelihood of people in developing countries, particularly the rural poor, through self-help sustainable management of tree and forest resources. The program was born out of the recognition of the need to find ways of increasing benefits from forest resources to people who still live in or near forests, understand how people (inside and outside the forest) use land and other resources affecting forest and tree management strategies, and how to design and carry out management systems at the local level. In its first phase FTPP developed methodologies and tools for community forestry. In the current phase, FTPP will concentrate on improving the training, planning and technical implementation capacities of selected national and local institutions and farmer organizations engaged in participatory rural development and community forestry. It will do so through collaborating with local or national organizations, supporting field projects and programs and disseminating new information through networking. Information exchange is carried out through the FTP network, consisting of 2,500 members in over 100 countries, as well as through an active publishing program.

### **6 Institutional collaboration**

Finally, FAO works closely with a large number of institutes, agencies, and other international bodies involved in the area of forest conservation and management and forestry for rural development. FAO has more recently been deeply involved in the formation of the Centre for International Forestry Research (CIFOR), the new institution being established for forestry research within the Consultative Group for International Agricultural Research (CGIAR); and will work closely with the International Centre for Research in Agroforestry (ICRAF) in its newly broadened mandate within CGIAR.

FAO is working to help forge links between developing country governments, donor countries, international organizations and non-governmental organizations, and to help catalyze the process of improved management and effective rehabilitation of forest lands. This can be achieved by coordinated actions at the global, regional, national and local levels.

## **Conclusion**

One of the most serious problems facing developing countries today is that of the severe degradation of their natural resources and of the resource base itself. Such degradation has economic, social, environmental and even political implications which may continue long into the future.

Land and natural resources cannot be conserved and rehabilitated through sporadic efforts and short-term projects; what is needed are long-term programs, backed by sound land use policies and strategies to integrate forestry and agriculture within the context of rural development. Foresters and agriculturists



have fundamental and complementary roles to play in this challenging endeavour.

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