APPROPRIATE ASSISTANCE IN FORESTRY

A Message to the Field on Forestry

by
Dan Deely, DS/ST

APPROPRIATE ASSISTANCE IN FORESTRY

Table of Contents

A Message to the Field
on Forestry
Dan Deely, DS/ST

APPROPRIATE ASSISTANCE IN FORESTRY

A. Introduction

Increasing attention has been focussed on forestry, forest resources and allied natural resources problems in developing countries within the bilateral and international donor assistance community over the past several years.

This growing awareness of forestry has been the result of such widely publicized situations as the critical fuelwood shortage in the Sahel region of Africa, water shortages linked to deforestation in Panama which may threaten operation of the canal, and recent discovery by the Thai government of an unexpectedly large 35% decline in that country's forest covered area over the past 20 years.

A veritable tide of actions and events has drawn and kept attention focussed on forestry issues:

- The United Nations sponsored a Conference on Desertification in Nairobi, Kenya in August of 1977 to develop a world plan of action to combat desertification.
- The World Bank issued a Forestry Sector Policy Paper in February of 1978 containing new guidelines for the bank's lending program.
- A.I.D. and the Department of State co-sponsored a U.S. Strategy Conference on Tropical Deforestation in June of 1978.
- The Asian Development Bank issued a Sector Paper on Forestry and Forest Industries in August of 1978.
- Eric Eckholm, Worldwatch Institute, published a paper on deforestation and related problems in February of 1979 which has been widely distributed under the title, "Planting for the Future: Forestry for Human Needs".

A U.S. Government Interagency Task Force on Tropical Forests which was formed as an outgrowth of the 1978 A.I.D.-sponsored Strategy Conference on Deforestation is expected to send its recommendations for a USG Policy, Strategy and Program on Tropical Forests to President Carter before the end of this calendar year.

The Global 2000 Report to the President which is now in preparation (being prepared jointly by CEQ and Department of State) dealing with probable global environment, population and natural resources in the year 2000 has concluded that "of all the environmental impacts of the study projections, deforestation probably poses the most serious problem for the world, particularly the developing world."

Against this background of increased national and international attention, and increasingly urgent and more specific mandates from the U.S. Congress through foreign assistance legislation (discussed in the next Section B) A.I.D. has been striving to respond appropriately to the varied forestry-related problems in developing countries through its bilateral development assistance programs.

Purpose of Message

This message is intended to provide some broad direction for A.I.D. Mission and Regional Bureau development assistance efforts related to forestry. The intent is not in any way to restrict the scope or the flexibility of Agency responses to forestry problems. The intent is rather to pose forestry problems within a general framework that should help to clarify and improve problem understanding, while providing a proper perspective from which to conceive and develop appropriate new initiatives, or to reevaluate and confirm the appropriateness of on-going projects.

When forestry and allied natural resources problems are examined within the framework herein recommended by A.I.D. and A.I.D.'s contract personnel, assistance projects should not only be individually appropriate, but a sense of consistency in Agency direction, and an improved appreciation of Agency purpose should become apparent both within A.I.D., and among host country participants and interested observers from other donor organizations.

After posing a general framework for examining forestry and natural resources problems in Section C, some broad directions for appropriate A.I.D. development assistance are shown in Section D to emerge from viewing the problem from the recommended perspective.

The existing and planned A.I.D. project porfolio dealing with forestry and allied natural resources problems is then discussed and summarized in Section E.

Some suggestions for greater future emphasis in forestry-related development assistance are then proposed in Section F through a general comparison of the Agency's present and planned portfolio with the appropriate directions for assistance that are shown to emerge from viewing forestry from the perspective provided by the general framework.

B. Specific A.I.D. Mandate for Involvement in Forestry

The U.S. Congress has given A.I.D. increasingly stronger mandates over the past several years for involvement in forestry as a legitimate aspect of its development assistance programs. Mandates have dealt with environment and natural resources, maintenance and restoration of land, vegetation, water, wildlife and other resources, forestry, soil conservation and renewable energy sources, including fuelwood. The most recent 1979 amendments to the Foreign Assistance Act significantly provide the single strongest and most specific Agency mandate for forestry project assistance to date.

The 1977 Amendments to the Foreign Assistance Act of 1961 (FAA) contained a new section, Section 118, which called upon A.I.D. to:

> "Furnish assistance...for developing and strengthening the capability of less developed countries to protect and manage their environment and natural resources. Special efforts shall be made to maintain and where possible restore the land, vegetation, water, wildlife, and other resources upon which depend economic growth and well-being, especially that of the poor.

The 1978 Amendments to the FAA changed the general development assistance policy statement in Section 102 to include reference to environment and natural resources as a "critical problem" area:

> "United States development assistance should focus on critical problems in those functional sectors which affect the lives

of the majority of the people in the developing countries; food production and nutrition; rural development and generation of gainful employment; population planning and health; environment and natural resources; and education, development administration, and human resources development."

Section 103 of the FAA was amended in 1978 to include specific reference to forestry and soil conservation:

"Assistance... shall be used primarily for activities which are specifically designed to increase the productivity and income of the rural poor, through such means as ...stimulation of small, labor intensive enterprises in rural towns: improvement of marketing facilities and systems; expansion of rural infrastructure and utilities such as farm-to-market roads, water management systems, land improvement, energy, and storage facilities; establishment of more equitable and more secure land tenure arrangements; and creation and strengthening of systems to provide other services and supplies needed by farmers, such as extension, research, training, fertilizer, water, forestry, soil conservation, and improved seed, in ways which assure access to them by small farmers."

Section 118 was expanded by the 1978 Amendments to include a call for environmental assessments of development assistance efforts and evaluations of developing country environmental and natural resource problems and capabilities for solving them:

"In carrying out programs under this chapter, the President shall take into consideration the environmental consequences of development actions.

In furtherance of the purposes of this section, the President shall carry out studies to identify the major environment and natural resource problems, and the institutional capabilities to solve those problems, which exist in developing countries. The results of these studies shall be reported to the Congress by March 1, 1979."

The 1978 Amendments to the FAA also called upon A.I.D. under Section 119 to become involved with fuelwood and other renewable energy sources:

"Furnish assistance... for cooperative programs with developing countries in energy production and conservation with particular emphasis on programs in research and development, and use of small-scale, decentralized, renewable energy sources for rural areas carried out as integrated parts of rural development efforts in accordance with Section 103..."

Cooperative programs with developing countries in energy production and conservation were further authorized under the 1979 Amendments to Section 119 to:

> "...include research on, and the development, demonstration, and application of suitable energy technologies (including use of wood); analysis of energy use, needs, and resources; training and institutional development; and scientific interchange."

Section 119 dealing with Renewable and Nonconventional Energy Technologies was further expanded by the 1979 Amendments to the FAA by adding the following subsection:

> "Inadequate access by the poor to energy sources as well as the prospect of depleted fossil fuel reserves and higher energy prices require an enhanced effort to expand the energy resources of developing countries, primarily through greater emphasis on renewable sources. Renewable and decentralized energy technologies have particular applicability for the poor, especially in rural areas."

The 1979 Amendments to FAA also contained under Section 103(b), the most explicit authorization language in the history of U.S. foreign assistance legislation for providing bilateral assistance to deal with forest resource depletion and associated soil and water resource deterioration:

> "The Congress recognizes that the accelerating loss of forests & tree cover in developing countries undermines and offsets efforts to improve agricultural production and nutrition and otherwise to

meet the basic human needs of the poor. Deforestation results in increased flooding, reduction in water supply for agricultural capacity, loss of firewood and needed wood products, and loss of valuable plants and animals. In order to maintain and increase forest resources, the President is authorized to provide assistance under this section for forestry projects which are essential to fulfill the fundamental purposes of this section. Emphasis shall be given to community woodlots, agroforestry, reforestation, protection of watershed forests, and more effective forest management."

The House Appropriations Committee Report accompanying the 1980 Appropriations Bill (June 14, 1979) urged A.I.D. to:

"...plan for and include reforestation activities in all future rural development programs, to address forest management considerations within the framework of environmental assessment policies, procedures and reviews and examine all current rural development projects to insure that, whenever applicable, they incorporate a forestry/firewood component."

President Carter made mention of the deforestation problem in developing countries in his Environmental Message delivered on August 2, 1979 and the President requested in a follow-up Memorandum to the A.I.D. Administrator (dated August 2, 1979) that A.I.D. evaluate its assistance efforts and "...give high priority to programs which would advance these objectives:

- necessary preservation of natural forest ecosystems and their rich complex of plant and animal life;
- multiple uses of highly diverse tropical forests, including management of natural stands, development of ecologically sound forest plantations, and combined agriculture and forestry;
- increasing yields in family-scale tropical agriculture to relieve pressures on forest lands that are not suitable for cultivation;
- developing integrated projects for reforestation, more efficient fuelwood use, and alternative energy sources."

A Proposed General Framework for Examination of Forestry Problems

This Section attempts to create a clearer understanding of forestry and forestry problems by proposing that forestry issues be viewed within a general framework that should help to sharpen and improve our perceptions of what these problems are and how they relate to other natural resource and socio-economic aspects of the rural land use context of developing countries.

Many statements have been made by representatives of developing and developed country governments, environmental and conservation groups, and international organizations in recent years concerning the nature of emerging forestry and allied natural resources problems. One of the most recent of such statements is that which appears in the amended introductory paragraph to Section 103 in the 1979 Amendments to the Foreign Assistance Act of 1961. (The 1979 Amendments were signed by President Carter on August 14, 1979 under the title of the "International Development Cooperation Act of 1979".) That paragraph reads as follows:

> "The Congress recognizes that the accelerating loss of forests and tree cover in developing countries undermines and offsets efforts to improve agricultural production and nutrition and otherwise to meet the basic human needs of the poor. Deforestation results in increased flooding, reduction in water supply for agricultural capacity, loss of firewood and needed wood products, and loss of valuable plants and animals. In order to maintain and increase forest resources, the President is authorized to provide assistance under this section for forestry projects which are essential to fulfill the fundamental purposes of this section. Emphasis shall be given to community woodlots, agroforestry, reforestation, protection of watershed forests, and more effective forest management."

This most recent brief statement of the forestry problem and mandate for responsive A.I.D. development assistance clearly alludes to a problem of

multisectoral dimensions. Some of the varied dimensions of the forestry problem can be illustrated by the following listing of descriptive terms which are often heard in discussions dealing with this subject:

FORESTRY ASPECTS

- DEFORESTATION
- HABITAT DESTRUCTION
- DIVERSITY LOSSES
- SPECIES EXTINCTION
- ECOLOGICAL DISRUPTION
- WASTEFUL/DESTRUCTIVE LOGGING PRACTICES
- TIMBER/FUELWOOD SHORTAGES
- WILDLIFE LOSSES

RANGE ASPECTS

- DESERTIFICATION
- FUELWOOD SHORTAGES
- RANGE DETERIORATION
- VEGETATION COVER LOSS

AGRICULTURAL SOIL RESOURCE ASPECTS

- SOIL EROSION
- SOIL FERTILITY DEPLETION
- SOIL STRUCTURE BREAKDOWN

WATER RESOURCE ASPECTS

- REDUCED INFILTRATION
- INCREASED RUNOFF
- SEVERE FLOODING
- SEDIMENTATION
- REDUCED DRY SEASON FLOWS
- LOWERED GROUNDWATER TABLES
- RESERVOIR CAPACITY REDUCTIONS
- INTERIOR & COASTAL FISHERIES LOSSES

Any discussion of the varied aspects of the forestry problem which innocently starts with "trees", soon encompasses not only forest "tree" management and forest resource protection and conservation, but wildlife and wildlife management, agriculture and agricultural conservation, range management and range conservation, sociology, anthropology, economics, rural development, energy, energy alternatives and renewable energy sources, agroforestry, environmental protection, watershed management, water resources planning, land use planning, natural resource planning and management and land use change management.

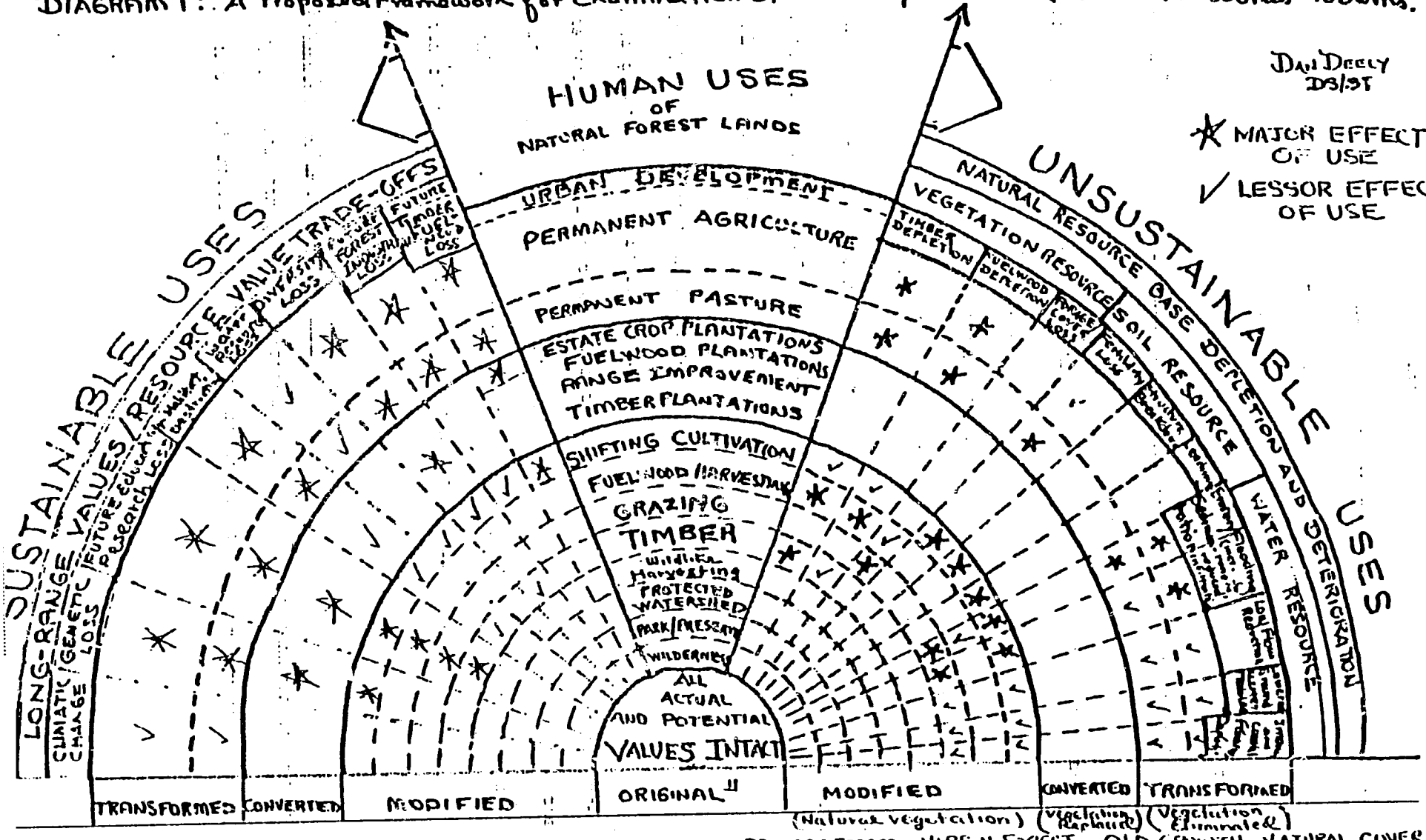
Therefore, any framework that would be truly adequate for use in examining forestry problems would have to provide some means for relating forests, trees, and the effects which people have on forests and trees, to the multisectoral dimensions of the rural lands context.

Diagram 1 is a graphic representation of some of the key elements of a proposed general framework for examining forestry problems. Physical aspects which easily lend themselves to direct portrayal are specifically labelled, while social/cultural/economic aspects must be inferred from the portrayal, and will be pointed out in later discussion. Each of the key elements of the proposed framework is discussed briefly in the paragraphs following.

1. Human Use and Land Use Change

Forestry problems cannot be understood without giving prominent attention to human use of rural lands, land use dynamics and land use change.

DIAGRAM 1: A Proposed Framework for Examination of Forestry and Allied Natural Resources Problems.



‖ ORIGINAL VEGETATION COVER, RELATIVELY UNDISTURBED COVER, PRIMARY FOREST, VIRGIN FOREST, OLD GROWTH, NATURAL COVER.

2. Forest Resource and Vegetation Cover Change

Human use of forest lands ranges from the most extensive of uses (such as primitive hunting and gathering) to very intensive uses (such as permanent agriculture and urban development). Increasingly intensive human uses of forest lands cause increasingly severe changes in the original forest or vegetation cover. Some uses only modify the original cover to varying degrees based upon use intensity and application practices. Other more intensive uses may convert the original forest or vegetation cover to some very different form, while still maintaining some modicum of similarity to the original forest's characteristics (timber plantations, rubber plantations, etc.). The most intensive uses so completely transform the original forest or vegetation cover that it bears no resemblance to the appearance of the original, such as forest clearing for permanent agriculture.

Although questions of forest versus non-forest uses (especially agricultural and pastoral uses) dominate the forest land and resource use decision arena, the importance of multiple forest use and forest use conflicts should not be forgotten. Even after a decision has been made to maintain a particular area in natural forest cover, some forest uses, such as intensive commercial silviculture and logging, may still not be compatible with other forest values and potential use objectives, such as primary forest wildlife protection, wildlife vs. livestock production goals, plant and animal genetic resource conservation, and biosphere preserve establishment. Forest use conflicts will continue even after more basic questions of forest versus nonforest use may have been resolved.

3. Sustainability of Human Use

Forests have often been described as a "renewable resource." This appellation has been given to forests in part because of their readily observable ability to regenerate themselves after being greatly modified by human use (as by timber harvesting), as well as because of their ability to "reappear" as if by magic through the natural process of plant succession where once they had been completely removed (as when old-field forest vegetation colonizes and takes over abandoned agricultural land). But sustainability of human use is a concept which goes far beyond renewability of forest cover modified by human use. Sustainability is a concept that carries with it important social, economic and technological connotations which are even more important. Sustainability suggests continued delivery of human benefits through continuing productive human use over time.

Sustainable development of marginal or fragile lands normally requires an even greater application of social, institutional, administrative and technological inputs to achieve success than does similar development of prime, highly stable and productive lands. The combination of marginality of the land and the greater need for supports of all kinds acts together as something of a "double whammy" to make successful development of marginal and fragile lands for intensive human uses a very doubtful proposition and a difficult undertaking. The tendency to direct most available financial, technological, social, institutional and administrative resources to the best areas, rather than to the poorest areas, and the characteristic lower

social, cultural and economic standing of the poor people who are most often forced to subsist on marginal and fragile lands, further exacerbates the problem.

4. Natural Resource Base Depletion and Deterioration

When human uses of the original forest or vegetation cover are unsustainable, depletion of the forest resource and/or deterioration of soil and water resources will result. Depletion and deterioration of natural resources vary widely under different conditions in terms of degrees and rates of degradation as well as impact on human use and human well-being. Enlightened management, conservation and maintenance of the sustaining natural resource base are becoming increasingly recognized as being essential for continued future economic growth and development and human well-being, especially that of the poor who are living near subsistence level.

5. Basic Human Needs

There are important relationships among meeting basic human needs, human use sustainability, and natural resource base depletion and deterioration. Human uses of forests and allied natural resources can be described in terms of people seeking to meet their basic human needs for food, water, energy, forage and materials. Increasing human populations in search of meeting these needs are the fundamental cause of increasing pressures on forests and other natural resources.

For example, when people use woody vegetation for cooking fuel, and carry

out such fuelwood harvesting in an unsustainable manner while their numbers and consequent need or demand for fuelwood continues to increase, fuelwood shortages are an obvious consequence. The unsustainability of this posed example fuelwood situation could be related to the manner in which harvesting is done, or to the demand for fuel exceeding the productive capacity of woodlands under a given form of management, or in the worst cases, under any form of management, even one of a high technological level, to produce supplies equal to or greater than demand. In either case, if soil deterioration begins to occur in concert with depletion of the woodland fuelwood supply, the soil deterioration may further reduce the supply in a vicious cycle leading ultimately to an abject failure to meet cooking fuel needs even at minimum subsistence level. As described in numerous accounts and articles, the fuelwood shortage posed here as an example can lead to cutting back on heating, with adverse health consequences, to skipping of hot meals, and to switching from fuelwood or charcoal to crop residues and dried cow dung as alternative fuel sources. As described by Eric Eckholm of the Worldwatch Institute in his paper, "Planting for the Future: Forestry and Human Needs," this leads to "diversion of organic matter and nutrients from fields to fireplaces", making soils under agricultural use less productive for lack of fertilizer and organic matter, and causing reductions in grain output. In this simple example, unsustainable woodland harvesting of fuelwood, then, can result in fuel shortages, foregone meals, reduced human comfort, increased human health problems, reduced nutritional levels, and reduced agricultural production--thus representing

a multi-faceted assault against meeting many basic human needs, especially the needs of the poorest of the poor, who are living at the subsistence level in rural areas.

6. Long-Range and Distantly Perceived Values and Value Trade-Offs

Human use of forests and allied natural resources, even when carried out in a sustainable manner, always involves value trade-offs. Many of these values are often more distantly perceived or longer range issues than are the more immediately visible effects of unsustainable uses such as fuelwood shortage, used as an example in the previous section. Among such longer range or more distantly perceived values associated with forest land use are such things as concern for genetic resources, ecological diversity, wildlife habitat, scientific research and educational values inherent in ecological preserves, local, regional and world climatic change, atmospheric CO_2 concentrations, international trade, future forest industrial development, potential future wood, timber, fuel and other forest products needs, future tourism and recreational opportunities, future water supplies, as well as the richness and beauty of the natural resource legacy that will be handed down to future generations.

When unsustainable use patterns are carried on over a period of time, progressive soil and water resource deterioration will result. Lands subjected to such abusive use will not only become progressively less productive over time, but may eventually become derelict or completely incapable of supporting any further productive use.

7. Reversibility of Change and Natural Resource Deterioration

Some changes in land use are reversible, while others may be, for all practical purposes, permanent. Many forest modifications are at least partially reversible, as are some conversions and transformations of vegetation cover. Some values given up or lost in making use changes can be recovered while others may be forever lost. For example, much of the potential scientific and educational value of an undisturbed primary forest biome will be lost, in terms of human time reckoning, once that forest is subjected to commercial logging. The single most irreversible result of use change is, of course, plant and animal life form extinction.

Many forms of forest depletion and soil and water resource deterioration are reversible to varying degrees, depending upon the levels of effort, levels of technology and financial resources applied to the restoration effort. The more severely depleted or deteriorated the resource, the greater the effort and the associated cost of restoring productivity. Restoration of derelict lands may be prohibitive in terms of cost and effort, and, therefore, for all practical purposes, severe deterioration is irreversible.

Viewing forestry problems within this framework of land use change, land use sustainability, resource depletion and deterioration and resource value trade-offs, leads us to some very important conclusions and to a clearer appreciation of some important facts about these problems.

1. Deforestation results from land use change involving clearing of forests for permanent agriculture and pasture to a far greater extent than it does from "harvesting" of trees for either wood products or fuelwood; so much so, in the case of commercial timber harvesting, in fact, that such harvesting for timber can be ignored, on a world scale, as a cause of deforestation.

2. Harvesting of trees and other woody vegetation in sub-humid and semi-arid areas, and on upland mountain slopes, often results in deforestation, but this usually occurs in combination with overgrazing, wild or man-caused fires, and periodic natural drought conditions in dry climates.

3. Commercial timber harvesting, when conducted in a sustainable manner (often referred to as "sustained yield" manner in the jargon of timber management) results in a temporary local depletion or reduction in standing timber volume, but this apparent reduction is made up by timber growth which is occurring under planned management in other parts of the forest. This means that the net reduction in timber volume in the face of continued timber harvesting may not only be zero, but total standing timber volume may even, in some cases, be increasing while harvesting is going on. A forest resource base can be maintained by a combination of: protection of forests; limiting but not stopping the clearing of forest cover for conversion of forest lands to other land uses (agriculture, pasture, etc.); ensuring that all harvest of fuel and timber or other wood material from forests is carried out in a

sustainable manner, i.e., on a sustained yield basis (either by planting, seeding, or natural regeneration); and, because forest land use conversions to other uses cannot be "stopped" completely, other lands not currently supporting forest cover must at the same time be reforested, afforested, or allowed to regenerate naturally to help balance conversion and transformation losses.

4. Commercial timber harvesting, when conducted in an unsustainable manner, can result in depletion or reduction in standing timber volume, timber quality and present and future timber value. Commercial timber harvesting very seldom directly results in deforestation, i.e., in complete removal of vegetation cover from the land surface, leaving the surface bare and open to severe erosion (except in sub-humid and mountainous zones where growth and patterns of natural regeneration and plant succession are slow). Logged-over forest lands may support a much modified or less valuable second growth timber stand or, in some cases, may support a highly unproductive vegetation cover, even sometimes dominated more by a tangle of vines and other noncommercial vegetation than by trees of commercial value; but, even in these cases, most poorly logged-over areas in the tropics support a very dense, luxuriant vegetation cover after logging, albeit a not very productive nor very valuable one.

5. Unsustainable fuelwood harvesting, commercial and non-commercial, especially in sub-humid and semi-arid zones and in steeply sloping uplands and higher mountain watersheds, directly results in more damage to allied

soil and water resources than does any other form of actual "forestry" activity.

6. In almost no case does critical widespread degradation of soil and water resources occur (except in steep, unstable mountain areas from careless logging and road-building practices) without significant and in most instances over-ridingly dominant contributions from various forms of shifting and permanent agriculture and grazing.

7. Soil fertility depletion is an especially critical aspect of soil resource deterioration associated with some forms of unsustainable shifting cultivation. When the length of fallow periods under shifting agriculture is reduced, and/or the length of the continuous cropping cycle is too much extended, leaching causes removal of nutrients from the surface soil layers, soil structure begins to break down, reducing water infiltration capacity and increasing runoff and erosion, and tenacious weeds and crop pests and diseases become more intense and further decrease crop yields. When this process of deterioration goes sufficiently far, tenacious grasses and other unproductive vegetation cover will invade cropped areas when they are left in fallow; ordinarily, a secondary forest community would become established, and would restore the nutrient status, and structure of soil. The unproductive cover may not only have no value, even for grazing, but also will not permit normal successional trends in secondary forest development to occur, and will not itself restore soil fertility or soil structure. The land is therefore frozen in a derelict condition and rendered largely useless for

8. Lands which are cleared for permanent pasture or for permanent agriculture, especially in steeply sloping areas, without application of sufficiently sophisticated agricultural soils management and soil and water conservation practices, may be subjected to excessive soil erosion and fertility depletion. When ground cover in pastoral systems which has replaced an original forest cover is overgrazed or otherwise mismanaged, erosion and soil depletion can occur from inadequate livestock management and application of conservation practices. A soil depletion syndrome similar to that associated with shifting cultivation can occur when forest areas are transformed to pasture or forage production in areas where rainfall is high and where soil nutrient status cannot be maintained under continuous grazing and forage production without application of fertilizer or periodic return to treed forest fallow.

9. Virtually all serious or critical water resource deterioration and hydrologic system disruption are caused by unsustainable shifting and permanent agricultural and pastoral systems; they are not caused by timber harvesting. Fuelwood harvesting in upland slope areas and in sub-humid or semi-arid areas can play a somewhat more important role as mentioned earlier, but normally these happen only in combination with overgrazing and poor agricultural practices.

Erosion-and-increased runoff from areas in agricultural and pastoral-use are what result in sedimentation, serious reduction in water quality, serious si...g of dams and reservoirs, and damage to equipment. Increased runoff and reduced infiltration caused by agriculture result in

lowered ground water tables, dried-up wells and springs, increased flooding which often damages lowland crops, homes, and infrastructure, and reduced dry season flows with adverse impacts on lowland irrigation, industry, fisheries, and public water supplies. This syndrome of hydrologic damage and deterioration is definitely not caused by timber harvesting.

10. Access and transport systems into undeveloped forest areas, either for timber or mineral extraction, are often an invitation for post-harvesting agricultural and/or pastoral development, planned or unplanned. But, again, critical soil and water resource damage and deterioration in such cases result from land uses after forest harvesting, rather than from forest harvesting per se. These land use patterns are occasioned by social, cultural, economic and political forces, including especially inequitable land tenure arrangements.. The forest harvesting itself, as pointed out previously, does not even cause deforestation in such cases, even when badly conducted, much less any of the other soil and water resource deterioration problems.

D. Broad Directions for Appropriate A.I.D. Assistance in Forestry

Examination of forestry problems within the proposed general framework, while giving careful attention to A.I.D.'s Congressionally legislated mandates, leads to identification of some compellingly evident broad directions for appropriate Agency development assistance in forestry.

The primary cause of "forest depletion" and "deforestation" has been shown to be the modification, conversion and transformation of forest and vegetation cover by increasing human populations seeking to meet their basic needs for food, energy, forage and materials.

Three broad thrusts or objectives for appropriate A.I.D. assistance in forestry emerge from viewing forestry problems from the perspective of the general framework. A.I.D. development assistance in forestry should be specifically directed toward these very broad objectives:

Resource Restoration and Production to Meet Critical Needs

1. Application of forest science and technology to reversing severe forest and vegetation cover depletion, and soil and water resource deterioration, and to meeting critical needs for food, fodder, fuel and materials.

Forest Resource and Land Use Planning

2. Improvement in recognition of forest resource values, and in wiser use allocations within the land use change and use decision process at local, province and national levels.

Social Forestry

3. Increased delivery of social benefits, especially those producing employment and income for local people, from forests and allied natural resources.

The first objective, directed at resource restoration and production, is largely a response to a forest and allied natural resource depletion and deterioration problem. Restoration and production efforts would in one way or another attempt to effectively redress critical wood supply shortfalls and soil and water resource damage. Soil fertility lossess and water supply reductions, as aspects of forestry problems, of course have direct bearing on nutrition level, health, food supplies, and other basic human needs beyond just the immediate supplies of wood material for fuel or for use in construction of shelter, etc.

The second and third objectives dealing with forest resource use planning, and with social forestry,which is aimed at making forests more socially valuable for people, represent positive initiatives directed at better meeting both short-term and longer-range human needs, while all the while advocating protection, conservation and wise use of forests and forest resources. The difficulty of carrying out a program effectively serving these often divergent objectives should not be underestimated. Short-term needs make adequate attention to longer-range values very difficult, and even modest advocacy of intrinsic "natural resource" values in the face of strong transformation and conversion development pressures will require a great deal of sensitivity and finesse on A.I.D.'s part in application.

A wide range of bilateral assistance efforts and types of development projects may validly serve one or more of these broad objectives. But some forms of assistance are likely to emerge much more often than others as being appropriate for meeting A.I.D.'s stated objectives within the context of the problem and the Agency's mandates. Potentially appropriate assistance interventions are discussed below in relation to each broad objective. These forms of assistance or those types of assistance projects which are likely to be of greatest import in serving each objective are identified for higher priority and more attention.

The majority of the interventions discussed as being appropriate for serving forestry objectives are already being carried out in varying degrees by A.I.D. Missions, and/or are being supported by the Regional Bureaus. In those cases where existing and planned project efforts are very well matched with the suggested directions for appropriate forestry assistance, this message will serve only to confirm the appropriateness, and to lend even stronger Agency support to those efforts. Where existing and planned project portfolios may currently show somewhat less then a desirable level of commitment, or degree of attention, to appropriate forms of forestry assistance, greater overall Agency efforts may be indicated as being desirable if stated forestry objectives are to be actively pursued. In most all cases, future Mission and Bureau project plans show trends toward expanded attention to the types of appropriate projects that would serve forestry objectives, so that even those areas which are suggested in Section F for greater future emphasis, largely will serve to confirm and to lend even more support to appropriate directions which have, in part, already been perceived by many of the Missions and Bureau Offices.

Resource Restoration and Production to Meet Critical Needs

Assistance efforts serving this objective would include those directed at alleviating critical shortages associated with depletion of closed forest and open woodland vegetation cover, and with reversal of critical soil and water resource deterioration which may be wholely or partially amenable to forest science or forest technological solutions; normally forestry solutions would be carried out in combination with socio-economic, anthropological, administrative, agricultural and agronomic, marketing, range science, educational, institutional, credit and finance, energy, water resources and watershed management aspects, often within an integrated rural development context.

Appropriate interventions dealing with degraded resource restoration and with meeting critical production needs will frequently be suited to incorporation into on-going or planned integrated rural development, energy, improved agricultural production, watershed and basin management, and range conservation and management projects.

The most important and most appropriate forms of forestry assistance serving this objective are:

- Fuelwood plantations, often in association with broader energy projects, or with semi-arid and upland mountain slope range and grazing management projects.

- Agroforestry, especially in association with unsustainable shifting cultivation in both tropical lowlands and upland slopes.

- Reforestation, especially in association with upland mountain slope agricultural soil and water conservation projects, or with critical catchment restoration projects.

Reforestation can only take place within the local social context, and types of lands and their uses that might be involved in actual reforestation efforts must always be a fundamental concern in project design. Those lands in developing countries which might be most likely to be made available for reforestation work include:

1. Derelict lands which have been abandoned after being abused by poor agricultural and grazing practices or lands which were not capable of sustaining such uses in the first place. Soils on these lands would most likely be low in fertility and severely eroded.

   Most "degraded" lands are often still occupied and being used by the agricultural and/or the pastoral peoples who cleared them. Even when restoration is possible (marginal agricultural and grazing uses must be stopped or better managed), restoration might often involve "revegetation" with grasses, legumes, shrubs and trees, rather than "reforestation" with trees only.

2. Lands where potential economic benefits to agriculturalists or pastoralists from tree crops would outweigh the benefits from competing agricultural or pastoral alternatives.

3. Cutover lands with poor quality or low volumes of standing timber following unsustainable commercial harvesting which has removed most or all valuable growing stock without making provision for adequate natural or artificial regeneration of forest trees; cutover lands dominated by vines and other noncommercial, unproductive vegetation cover would fall into this category.

4. Lands supporting unproductive vegetation cover having little or no value for commercial use, local noncommercial use, soil maintenance/improvement, or for wildlife habitat. Lands severely depleted by unsustainable shifting cultivation practices and repeated fires that were later taken over by tenacious "weeds" of

5. Lands that were marginal and unsuited from the moment of clearing to agricultural and pastoral uses which could be returned to a forest cover before reaching a derelict condition, thus providing fuel or wood material, and arresting soil and water resource deterioration.

6. Lands in critical catchments that were cleared for agricultural and pastoral uses but where such land uses are now determined to be incompatible with needs for adequate quantities and timing of high quality water yielded by the watershed, and where the benefits of meeting these water needs are now thought to outweigh benefits that can be realized from continued agricultural and pastoral uses.

7. Lands which were never intentionally cleared or commercially harvested, but were degraded by overgrazing, fuelwood gathering, fire and/or by desertification processess in semi-arid areas or by other unsustainable uses, such as poorly managed agriculture, on upper slopes.

Forest Resource and Land Use Planning

Development assistance efforts that are supportive of this objective would include those that serve to make local, state/province, regional and/or national forest resource and forest land use, modification, conversion, and clearing a more thoughtful, more diliberate and better managed process, and those that would serve to increase awareness and recognition of forest resource and allied natural resource values and value trade-offs, so that near-term and future gains and losses, social, economic, and environmental, associated with use decisions are taken more completely into account.

Appropriate forms of development assistance supportive of this objective would include:

- Study and examination of the socio-economic factors which influence the local community, and even the individual farmer, level of decision making on resource exploitation, management, allocation and use.
- Forest and woodland land use capability survey and analysis.
- Natural resources planning and management studies, surveys and institution building, and conservation program development.
- Forest resource and aspects of watershed and water resource planning and management.
- Forestry aspects of general land use planning and use allocation projects.

Social Forestry

Appropriate assistance efforts dealing with social forestry would include those which increase or improve delivery of social benefits, especially to the poor rural farmer and small community poor, from forests and forest resources. The majority of assistance projects in this category would be likely to fit well into the integrated rural development project context.

The most important and appropriate forms of assistance which are likely to be supportive of the social forestry objective are those which create employment and income for local people from natural primary and secondary forests and woodlands, such as:

- Small scale forest-based industry and cottage crafts development which relies on natural forest resources, and which produces food, fodder, materials, fuel, employment and/or income benefits.
- Specialized forms of Agroforestry such as use of favorable microclimates created by natural forest and vegetation cover to raise food, fodder or other useful products.

- Sustainable natural wildlife harvesting and fish culture for food or income.
- Expanded local involvement in management of natural forests and natural woodlands, especially with support from private enterprise or government (with donor backing) financed incentives which help to better balance longer-range societal values against immediate short-term needs of local residents.

E. A.I.D. Involvement with Forestry Assistance Projects

Any attempt to obtain project data within A.I.D. or to summarize A.I.D. project experience in any narrow subject area that is multi-sectoral and does not coincide with a traditional major sector such as population, health, education, agriculture, etc. always suffers from a number of typical shortcomings. A recent attempt to gather information on A.I.D. forestry projects during July and August, 1979 was certainly no exception. But even while recognizing limitations as to strict accuracy, completeness and some problems of interpretation of project descriptions, the most recent PPC/DSB summary of A.I.D. forestry and forestry-related projects, including past, currently active and planned projects from the late '60's through the 1981 ABS usefully provides some insights into major Agency trends and directions in forestry assistance.

Tables 1 and 2 summarize recently compiled data on A.I.D. forestry project experience. Table 1 shows numbers of projects and life of project values by year for all Regional Bureaus and Development Support Bureau (and its predecessor, the Technical Assistance Bureau). Table 2 shows the general types of forestry and forestry-related projects by bureau.

A number of important conclusions may be made from these data, in spite of their admitted shortcomings which were referred to earlier.

1. Prior to 1972, A.I.D. had minimal involvement in forestry or forestry-related development assistance, although some of the small number of forestry projects may have been significant within the countries, or locales within countries, where they were carried out.

Table 1: Summary of A.I.D. Forestry and Forestry-Related Projects (Past, Current and Planned from the Late 1960's through the 1981 ABS)

	Prior to 1972 ($million)	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
AFRICA											
1. Number and Value(Life of Project) of New Forestry-Related Projects (Minor Forestry Components) Initiated Each Year	5 (12.2)	1 –	3 (14.6)	1 (12.8)	4 (9.8)	2 (7.4)	6 (36.1)	5 (51.2)	8 (93.4)	4 (15.3)	2 (3.5)
2 Number and Value(Life of Project) of New Forestry Projects Initiated Each Year (Major Forestry Components)	– –	– –	– –	– –	– –	1 (1.1)	– –	1 (.5)	9 (47.3)	6 (22.1)	2 (25.4)
3 Total Number and Value of All Projects	5 (12.2)	1 –	3 (14.6)	1 (12.8)	4 (9.8)	3 (8.5)	6 (36.1)	6 (51.7)	17 (140.7)	10 (37.4)	4 (28.9)
LATIN AMERICA AND THE CARIBBEAN											
Total Number and Value of All Projects	3 (9.4)	– –	– –	– –	– –	6 (27.1)	1 (15)	1 (19)	9 (32.2)	10 (28.9)	4 (19.3)
ASIA											
Total Number and Value of All Projects	5 (58.4)	– –	– –	– –	– –	2 (14.7)	– –	1 (8.6)	5 (77.5)	4 (37.5)	– –
DEVELOPMENT SUPPORT BUREAU											
Total Number and Value of All Projects	1 –	– –	1 –	1 (1.0)	1 (.7)	1 (1.7)	– –	1 (22)	4 (25.3)	1 (2.8)	1 2.4
NEAR EAST											
Total Number and Value of All Projects	– –	– –	– –	– –	1 (15)	3 (16.4)	– –	1 (2.3)	1 (5)	1 (3).	– –

Table 2

FORESTRY INTERVENTIONS	AFRICA		ASIA		LAC		NE		CENTRALLY FUNDED	
	major	minor	major	minor	major	minor	major	minor	major	minor
Sub-total	18	38	5	7	5	26	6	5	8	
Institution Building	14	14	5	2	4	12	3	1	4	
Forestation	11	10	3	6	5	13	1			
- large area	2	1				2				
- small scale	4	8		3	2	4	1			
Agroforestry		1	1	1		1		1		
Arid Zone Vegetation	3	20					3	1		
Forest Resource Mgmt.	5	4	2		1	6		2		
Park & Preserve Mgmt.	1									
Other		9		1		1	2		4	
Forest component (uncertain)		9		1		1	2		2	

2. Especially since 1975, the number and value of forestry and forestry-related projects have been rising dramatically (Table 1 data show a 400% to 500% increase in A.I.D. forestry assistance between 1975 and 1979).

3. The Africa and Latin America Bureaus have been involved in or are planning the largest numbers of forestry institution building and forestation projects, mostly in FY 1979 and FY 1980.

4. The Africa Bureau, owing in some large measure to the Sahel Program, has by far the greatest experience in arid zone vegetation management projects.

5. The Asia Bureau has responded much less strongly over the past two to three years in initiating new forestry and forestry-related projects than have the Africa and LAC Bureaus.

6. The Agency has almost no agroforestry projects either under way or planned through the 1981 ABS.

F. Suggested Areas of Assistance for Greater Future Emphasis

A comparison of current and planned A.I.D. forestry and forestry-related assistance projects with recommended A.I.D. forestry program objectives, shows several areas of assistance which are already receiving appropriate attention, but also shows several other areas that should be given somewhat greater future emphasis.

All A.I.D. Missions and Bureaus should examine current and planned projects for possible opportunities for giving more emphasis and greater attention to the recommended broad forestry program objectives.

The Africa Bureau's substantial fuelwood project efforts are very consistent with recommended A.I.D. forestry program objectives. The recent project trends toward natural woodland management for fuelwood production within a range management context are also appropriate, and consistent with the broad directions for a forestry program and should be given even more emphasis in future.

All regional Bureaus with the exception of the Near East Bureau are involved in, or are planning, upland soil and water conservation projects involving forestry components. Reforestation and conservation tree plantings are prominent features of most of these projects. Upland conservation forestry closely tied to upland agricultural soil and water conservation, upland grazing management, and fuelwood and alternative energy components deserves moderately increased emphasis. Watershed management and critical catchment projects already appear in the current and planned portfolio, but also deserve somewhat more future attention. Reforestation projects in critical catchments which have been transformed (meaning "cleared") to other uses and which are hydrologically degraded as a result, would likely dominate catchment restoration projects in support of objective #1 (resource restoration and production to meet critical human needs). Forested catchment protection and conservation projects in areas supporting original or only partially modified forest cover, would be included among projects serving the second

recommended program objective, namely improved forest land and forest resource use planning and allocation.

Although some few recent project initiatives have begun to deal with the subject of agroforestry, an Agencywide expansion of attention and emphasis in agroforestry seems warranted. Agroforestry efforts will largely fall during initial stages into strongly applied research projects and associated institution and administrative capability building within areas of unsustainable shifting cultivation, with substantial socio-economic, cultural and technical components. Agroforestry project goals will likely be most often directed at arresting critical soil fertility and water resource deterioration, and at meeting critical local human needs from food, fodder, fuelwood and wood materials consistent with the forestry program resource restoration and production objective.

A trend toward increasing emphasis on natural resource planning and management projects is clearly discernable within the A.I.D. portfolio. This trend is consistent with the second broad forestry program objective and certainly shows the Agency to be pursuing an appropriate direction in its assistance efforts in this area. Even while this trend is being encouraged, however, greater attention should be directed at the social, cultural and economic context of local community and individual level decision making in resource use and allocation, which do not seem to be currently receiving the attention that their extreme importance deserves. Forest land use capability studies and national level resource use planning may often fail to achieve their desired objectives of resource conservation and appropriate sustainable use without attention to the local or individual social context; obviously landlessness and near-landlessness and questions of land tenure would in many instances be important aspects of the local social context.

The general concept of "social forestry," while not being in any sense mutually exclusive from critical restoration and production, or from forest resource

use planning and allocation, does neverthaless carry with it distinctive implications and connotations well justifying its separate recognition as a program objective. The "social forestry" concept implies delivery of human benefits, on the one hand, while protecting and conserving the natural forest and forest resource, on the other.

This area is probably receiving at the present time, the least attention within A.I.D.'s current project portfolio, of all the general directions for appropriate assistance under the proposed forestry program.

Pursuit of this objective may require even more in the way of innovative project design than the relatively untried and untested domain of agroforestry. Integrated rural development projects probably provide the best opportunity for addressing social forestry initiatives within the range and scope of current A.I.D. assistance efforts. Attention to innovative social forestry efforts within integrated rural development projects should be encouraged as a high priority and important future direction under A.I.D.'s forestry program.