CAMEROON NATURAL RESOURCES MANAGEMENT ASSESSMENT

Edward Scott
Joseph Tabor
G. Hans Buys
Robert Forester

IRG, Ltd. Project Director:
John Michael Kramer

December 12, 1991

AID IQC No: PDC-5517-I-00-104-00 Delivery Order #9

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

1.0 INTRODUCTION AND RECOMMENDATIONS

1.1 PURPOSE AND MISSION

1.1.1 Purpose

This report describes the current status of human and natural systems interactions in the Republic of Cameroon (Cameroon), and to delineate options for interventions which will support sustainable management natural resource management. It is based on a multi-disciplinary 4-week study conducted in Cameroon from August 5 to August 30, 1991. The study focused on the ecology and economy of Cameroon, with particular reference to its tropical forests and the interactive diversity of its vegetation and wildlife. The study is placed in the context of the larger economic, political, developmental, institutional, and human framework which affects those resources.

Contractual delays in fielding the study team resulted in significant operating constraints. Time in country was reduced from 6 weeks to 4. The timing of field work was very inopportune since it coincided with the rainy season, civil unrest, travel restrictions and the traditional vacation period, all of which combined to severely limit movement in country, contacts and site observation. The methodology of document review, meetings and limited field observation was, however, sufficient to identify the major obstacles to improved natural resource management in Cameroon and to suggest areas in which more detailed investigation would be appropriate prior to decisions regarding programming.

1.1.2 Mission

The pertinent mission of U.S. Agency for International Development (USAID) in this country is supported by the 1987 Amendments of Sections 118 and 119 of the U.S. Foreign Assistance Act and the Congressional directives on global change in the Authorization and Appropriation Acts of FY 1990 and FY 1991: **these require that AID promote the conservation of biodiversity and tropical forests (USAID/Cameroon 1989; USAID 1991).** Biodiversity and tropical forests are important components of the natural resources sector in Cameroon.

1.1.3 Sector for Development

In its current system of activity codes (e.g., USAID/Cameroon 1991), the agency distinguishes six major sectors for development: agriculture, education, health, natural resources (or: energy/environment), population, and private enterprise. Natural resources may be defined simply as things not created by humans but that humans can use. This includes natural landforms, soils, waters, and atmosphere; and native plants, animals, and other organisms (excepting people). The natural resources sector does not include animals or plants derived from agricultural practices or imported by humans, nor the physical

characteristics of the environment that are the intentional or incidental result of human action.

1.2 BIODIVERSITY AND TROPICAL FORESTS: STATUS AND CHALLENGE

Biodiversity is the genetic, morphological, and behavioral diversity within and among the wild, native, biological species of an area. Tropical forests represent both a crucial component of and a fostering environment for biodiversity. Biodiversity represents a value in itself which surpasses national boundaries; understood properly, it may also provide a renewable support for the people of an area.

Cameroon encompasses large remaining tracts of humid tropical forest and a wide range of ecological communities. Both contribute to a rich biodiversity. Major areas of special significance include the **mountain forests** of the western mountains, the **lowland evergreen forests** of the southeast and of the southwest, and areas of the **northern savanna**. Many of the areas of rich biodiversity overlap with those areas defined as **tropical forest**.

1.2.1 Direct problem

These resources, however, are being depleted faster than they are being renewed. There are two primary reasons:

(1) invasive agricultural clearing without soil fertility management to allow long-term farming use;

(2) use of forests as cash crops to support an inefficient economy seeking alternative income in the wake of the 1985 market plummet in oil, cocoa, and coffee (on which Cameroon had heavily relied).

1.2.2 Consequence

Inroads on forested acreage threaten wildlife populations and reduce richness and balance of natural systems. Deforestation leads to soil erosion and to a decrease in soil fertility. As lands produce less, farmers seek remaining forested areas to cultivate for crops.

1.2.3 Contributing Factors

The relative boom in Cameroon's economy occasioned by the discovery of oil and the success of cocoa and coffee markets in the early 1980s led to an increase in social support services (including subsidies) and an increase in layers of government workers whose salaries were more than competitive.

When markets for those commodities weakened, the government's economic policies weakened protection for natural resources. Employment dollars in a given Ministry tend to remain high to support jobs and maintain political stability, but operating dollars are cut. Education and protection/support for resources have suffered. Subsidies to farmers have not been paid, forcing individuals to support their families by harvesting readily available resources without replacement/renewal.

In response to a weakening economy, the Government of the Republic of Cameroon (GRC) is focused on maintaining itself and the country now and in the immediate future. Therefore, it directs attention more readily to short-term (economic, exploitative) rather than long-term (economic/resource renewal and preservation) goals.

1.3 REPORT PRESENTATION

This report is shaped to describe the existing situation of each factor, then to analyze, evaluate, and recommend.

- **This chapter (1.0: INTRODUCTION AND RECOMMENDATIONS)** presents a brief background, followed by summary conclusions and options.

- **Chapter 2.0 (STATUS OF BIODIVERSITY AND TROPICAL FOREST RESOURCES IN CAMEROON)** describes the existing environment for these critical factors and the threats to their continued existence.

- **Chapter 3.0 (ECONOMICS REPORT)** present the economic framework and crisis which has affected the natural resources and their management.

- **Chapter 4.0 (POLICY AND INSTITUTIONAL FRAMEWORK)** describes and evaluates the current policies as they are written and implemented, as well as the institutions which administer them.

- **Chapter 5.0 (SUSTAINABLE AGRICULTURE)** describes current agricultural practices and potential for developing practices which will foster goals for biodiversity.

- **Chapter 6.0 (CAMEROON FOREST INDUSTRY)** examines the scope and economic potential in terms of practices in the forest industry.

- **Chapter 7.0 (ROLE OF PRIVATE VOLUNTEER ORGANIZATIONS (PVOs) AND NON-GOVERNMENT ORGANIZATIONS (NG0s) IN NATURAL RESOURCES MANAGEMENT)** describes present organizations and roles for organizations other than those of the GRC, as well as a solid ongoing PVO/NGO project.

- **Chapter 8.0 (DONOR ACTIVITIES IN NATURAL RESOURCE MANAGEMENT)** establishes criteria for measuring contributions to conservation, details other donor projects in Cameroon, and describes current and potential USAID interventions.

1.4 SUMMARY CONCLUSIONS

- To improve natural resource management in Cameroon, the affected participants must seek consensus on long-term development goals.

- These must include a balance between environmental sustainability and the short-term imperatives of the economic (and therefore political) crisis.

- To make better use of its endowment of natural resources and biodiversity, both the citizens of Cameroon and other interested parties must be engaged in sustainable development.

The economic crisis has had a seriously adverse impact on the Cameroon government. The crisis has forced the government to cut back sharply on its budgets, reducing resources precisely to those areas targeted for this review. Simultaneously, the government has had to engage in a new dialogue on public policy with international and national counterparts, at a time when the traditional channels of political exchange are under severe stress.

Three factors call for action:

- The physical and institutional status of parks, wildlife, and tropical forests--the source of biodiversity--has reached a critical point, although this condition is not widely recognized locally.

- Biodiversity is the subject of recent U.S. Congressional mandates and significant USAID interest.

- Biodiversity conservation has not benefited from major donor interest or investment.

USAID has not done enough and could do more. In particular, USAID-Cameroon has not met its fair share of the Development Fund for Africa (DFA) target for natural resources management (NRM). Now is an opportune time for the Mission to focus its attention on the sector, as NRM can address critical economic, social and environmental concerns. By using PVOs and NGOs, both Mission and GRC management burdens can be minimized.

The most prominent long-term opportunity for USAID arises from the lack of coherence and coordination in the area of natural resource policy and project development. A few NRM initiatives have taken place. Some have been relatively successful. However, conflict and disorganization are obvious at both national and international levels. The most productive starting point for this dilemma would be donor coordination.

1.5 OPPORTUNITIES WITH USAID/CAMEROON CURRENT STAFF AND FUNDING

- **The Mission could expand its PVO-NGO\NRMS Cameroon project (see Chapter 7.0) to reinforce local level private sector capability.**

  Local groups could be prepared in the following areas:

  - extension and agriculture technologies
    - Tropical Root and Tuber Research project (ROTREP)
    - National Cereals Research and Extension project (NCRE)
    - Institute for Agricultural Research (IRA),
  - agroforestry in the North, and
  - natural resource management with participation at local level, especially buffer zones around parks and reserves.

  This process can simultaneously support four goals: the development of indigenous capabilities, privatization, democratization, and NRM.

- **The Mission could conduct biodiversity interventions at established national protected area priorities.**

  Interventions for the Kupe reserve and the Black Rhino in Bénoué and Boubandjidah parks (estimated at less than 30 animals remaining), would represent immediate short-term actions and benefits.

  - Forest clearing is accelerating at Kupe.
  - The Black Rhino, which may be a separate subspecies, is imminently vulnerable: it will most likely disappear within the next few years, due to road-building in the area. Provincial park managers state that foreigners are

purchasing Rhino horns on a contract basis from local hunters/poachers at CFA 250,000 per animal.

- Support for the Tri-National Park may also be considered if proposals containing clear and sound interventions can be obtained.

- **The use of the Debt Swap mechanism could be considered as a means of influencing investment and producing desired long-term effects.**

- **ROTREP and NCRE results could be disseminated.**

Current USAID/ARD projects, ROTREP and NCRE, could focus on applying past research and disseminating results at the local level. Opportunities for private sector enhancement exist in both replication (ROTREP) and dissemination (ROTREP/NCRE). Small businesses, private entrepreneurs, or PVOs operating on a "for-profit" basis should seek to replicate improved varieties.

The Cameroon Agriculture Planning Project (CAPP) project does not appear to be influencing policy and planning as designed: issues of personnel, organization placement, and conflict interfere. Since CAPP focuses on minimizing instability and maximizing short-term revenues, reorientation of the project in the current political context would be extremely difficult. To optimize USAID investment, project re-configuration (including personnel, tasks and engagement of support at top GRC levels) could be explored.

- **The Free Trade Zone (FTZ) initiative could be actively supported.**

USAID private sector staff could continue aggressive support for privatization of the FTZ initiative for the timber industry. Near-term pressure could be applied to extend FTZ to:

- Primary (harvesting) activities associated with qualifying secondary (manufacturing) activities. This could include eliminating import duties and other bureaucratic roadblocks on mobile logging and other related equipment. Work permits for expatriate operators/trainers for equipment and practices should be facilitated.

- Introduction of FTZ features that specifically favor forest industry development, such as grandfather clauses to mitigate against the impact of unforeseen changes in taxes legislation, and forest management.

- The Mission could consider retraining/focus-training individuals for immediate impact.

USAID could consider reorienting the human resources (education/training) portfolio toward transforming our prior investment in students to specific target-oriented programming or private sector management techniques. Unemployed or under-utilized graduates from the U.S. education system could receive short-term (3 months to 1 year) retraining in specialized institutions such as the American Management Association programs linked with universities or institute-operated application studies courses (e.g., John F. Kennedy School, Harvard/public policy, etc.). Retraining, in short-term programs for those in whom the Mission already has a large investment would be more cost-efficient than long-term training for new diploma candidates.

1.6 OPPORTUNITIES REQUIRING ADDITIONAL USAID INVESTMENT AND A LONGER TIME FRAME

- **The Mission could explore several ways to foster policy and legislative reform.**

The World Bank is assisting the GRC to reform forestry and wildlife laws and policies. The United Nations Development Program will also implement a study on this subject in Fall 1991. USAID/Cameroon could explore opportunities to assist the GRC or other donors in their policy and institutional reform efforts. For example, the USAID-funded Land Tenure Center (University of Wisconsin) could provide technical assistance in its specialty. USAID/Cameroon could also assist the GRC in exploring opportunities to provide a percentage of tourism revenues to protected areas and rural communities. Presently, the GRC-protected area managers are restricted to a fixed budget.

- **A National Environmental Action Plan (NEAP) approach could be explored.**

A promising tool is the National Environmental Action Plan process coordinated by the World Bank. USAID/Washington has experience in the NEAP coordinator roles (e.g., Rwanda, Uganda) at the national level. The long-term NEAP effort (2-4 years) requires that the coordinator work with the donors and national groups to establish the broad canvas against which they may coherently discuss the investment, policy, and project decisions and may engage in the frustrating but necessary process of conflict resolution.

A previous effort, the Tropical Forestry Action Plan (TFAP) was initiated in 1986 and reviewed in 1988. The report focused narrowly on the areas of forest production, forest conservation, and institutional development of the forestry sector. The TFAP missed an opportunity to address a policy and legal structure for sustainable natural resources management in Cameroon.

If the current World Bank structural adjustment program and planned United Nations efforts to assist the GRC in establishing a new policy and legal structure are unsuccessful, a **joint World Bank/USAID NEAP** could potentially work with the GRC to develop such a structure. Unlike the TFAP, a NEAP is designed engage the GRC in a process to establish links between the natural resources management and other related sectors (e.g., agriculture, economic development, tourism).

Some of the issues that the NEAP process could explore include:

- Legislation to permit sustainable hunting and gathering in protected areas;
- The present land tenure system (e.g., state ownership vs. community ownership, and management of their natural resources base);
- Links between natural resources and other sectors (e.g., agriculture, economic development, tourism); and
- Legislation to provide economic incentives to private companies for sustainable forest extraction.

The NEAP process requires constant support at the highest level of the international (Ambassador/USAID Director) and national (Prime Minister/Minister) representation. USAID should embark on major investments in policy reform initiatives only if all parties accept this approach. Further investment in the current environment will not achieve the impact and changes which are both desirable and possible.

Before making a decision in this area, USAID should evaluate this intervention over the next 6 to 8 months, since the process is influenced by personalities (e.g., Bank Directors, host country government officials) and changes are likely during this period.

** **The end result could be a policy reform program for Biodiversity.**

If USAID (or other donors) can create a coherent approach into the NRM area, it could result in a policy reform program (NPA) for Biodiversity. Elements to be included in an NPA are:

- Creation of a concession or contract system for the management of parks and reserves by private conservation groups (World Wildlife Fund (WWF), Conservation International (CI), local PVO). The government retains only policy monitoring and enforcement roles. A private management system could absorb current park employees wherever possible.

- Privatization of the tourism system. Tourism can support most, if not all, of the operating and protection costs of the parks/ reserves network, and make a substantial contribution to the economies of surrounding areas, if handled efficiently. This process would involve the liquidation of the parastatal SOCATOUR, whose current debt to the Waza park alone reaches approximately to CFA 100 million (US $350,000).

- **The Mission could support timber marketing efforts only if other help fails.**

The forestry sector has received major investments by the World Bank, Canada, and the USAID in the past. The Private Sector Office could consider providing assistance with marketing Cameroon forest products only if other donor investments do not successfully address this issue. This process would be linked with current USAID support of the FTZ initiative. The participation of the U.S. timber industry and product distributors would broaden Cameroonian experience and efficiency in international markets.

- **The Mission could assist silviculture through industry and university research groups.**

The issue of silviculture is essentially untouched in Cameroon. This limits the forest industry's ability to meet regeneration obligations which must be part of any Forest Management Plan. USAID could help resolve this deficiency by working with industry and university research groups to establish basic silviculture prescriptions (i.e., site preparation, procedures for planting, brushing, and weeding; pre-commercial and commercial thinning; and harvesting).

- **Long-term support activities could begin within 6 months.**

If USAID decides to intervene in any of the long-term opportunities, preparatory activities could be started over the next 6-18 months. These could include:

- studies of land tenure (especially in the North, to complement the World Bank/German Aid (GTZ) activity in the south),
- education, training, and staffing requirements for the above initiatives,
- privatization of extension and improved crop replication,
- forest product market status and potential,
- biodiversity and wildlife inventories, and

- studies on the economics and feasibility of parks and tourism in private hands.

1.7 SECTORAL FINDINGS AND CONCLUSIONS

1.7.1 Economic Framework

The crisis has had a marked effect on the management of Cameroon's parks. The shift of management priorities to those that emphasize revenue generation and budget cuts have reduced the ability of the Departments charged with park management to pursue non-exploitative, conservation-oriented management programs.

GORC earmarking of some or all of the park entrance fees to meet park's recurrent costs should be a policy reform AID should carefully consider and promote through its program conditions.

1.7.2 Policy and Institutional Environment

The responsible Ministry should have a policy and legislative Branch. Aspects of current ministerial responsibility for forest resources is invested among twelve different Ministries. The Cameroon situation would improve if a policy and legislative branch were instituted within the responsible Ministry. Where the Ministry shares other resource mandates, the responsibility of this branch should fall to the deputy responsible for the forest sector to maintain a measure of independence from non-forest sector resources and to ensure that an identifiable individual is in charge and accountable.

A Chief Forester position should be created. In other forestry jurisdictions, overall legislative responsibility usually rests with a single Minister; and the officer accountable for the majority of legislation adjudication, amendments and implementation is a Chief Forester. The title imparts a clear responsibility for forest resources management. Traditionally, the Chief Forester has considerable power to direct forest management planning and implementation and a clearly defined independence from more senior and political officers. Cameroon would benefit from creating such a post.

Legislation should be developed with all due speed. The forestry legislation reform is premature in some respects (preceding a resource management plan) and overdue in others (because of its delay in recognizing and supporting non-timber exploitation objectives). Even where enabling legislation is seldom revisited , related regulations may continue to change.

Coordination should be established between those writing and those implementing policy. The mechanisms to prepare and effect regulations should include a close liaison between those drafting regulations and those promoting and eventually implementing them. Such a mechanism does not currently exist, partly because required communication between regional and central administration is lacking and partly because adequate personnel are lacking at all levels, from field officers, through to regional directorate staff and Ministry executives.

The country needs a comprehensive Forest Policy Manual. The manual should address all policy, regulatory and legislative codes, and practices. For each level, it should outline required documentation (plans, licenses, annual reports, audits, etc.), distribution of responsibility among officers, sanctions, renewal or amending procedures and associated policy, regulatory and legislative codes, and practices. Once developed, it is perhaps the most critical and useful component of a country's resource planning and management support. USAID/ Cameroon could support the development of a Forest Policy Manual.

The draft legislation should be professionally evaluated, with particular reference to the overbalance toward exploitation. Technical assistance should fully examine the full range of issues, including revenue generation, rational management participation, and conservation in the final legislation. A series of regulating decrees which follow the passage of new legislation will also be crucial in making the law operational. The uneven balance between exploitation and conservation is a strong concern, given the content and tone of the Presidential directive of March 1990 which exhorts the Ministry of Agriculture to increase forest exploitation in response to GRC revenue requirements.

Private sector involvement should be fostered in legislation. Legislation should encourage and provide for private sector involvement in the development of a forest industry sector in Cameroon, so that entrepreneurs can plan according to their interests, as well as those interests imposed upon them by the state. Such encouragement of vigorous entrepreneurial activity can then be channeled toward the enhancement of society's goals.

Legislation should provide for both conservation and economic development. A balance must be struck between divergent interests. Clearly, sustainable development and environmental conservation should dominate overall objectives. The scope and structure of potential private sector involvement must first be established; then, transition or evolutionary incentives should come into play to encourage its engagement. Legislation should reflect a pragmatism that, though based in broader multifaceted social goals, does provide the flexibility to stimulate private sector development.

USAID has an opportunity to effect change by supporting a NEAP process (described above under Section 1.6).

With the current liberalization initiative and the consequent changes in government policy formulation and institutional framework, a process which is open and transparent could be begun. The acquired behavior of current bureaucrats will require a longer time to modify than that needed to adopt better policies. The slow rate of behavioral change will produce tension and conflict which will make the liberalization process difficult. In view of the existing traditions, government action must ensure compliance by its bureaucracy with needed changes.

1.7.3 Agricultural Sector

Local and alternative markets could be developed and fostered. There is a need for alternative market development and local product promotion. As one observer stated, when the cocoa market was good, all the houses had tin roofs and all of the children went to school. The cocoa and coffee markets may come back, but there should be some local products that can be promoted and sold to help bridge the gap between now and a time when the market may turn around.

Soil stabilization and fertility enhancement are excellent long-term investments, but face problems. The rural-to-urban migration has caused a shortage of manual labor in many rural areas. The young, the brightest and those with the most initiative have left. Soil stabilization activities, particularly levelling, terracing, and the construction of check dams and gully plugs, are labor-intensive in construction. and demand constant labor-intensive maintenance to preserve their usefulness. The aging population remaining in rural areas may not be willing or physically able to maintain these structures.

Soil stabilization and fertility programs are a long-term commitment without immediate benefits. Often the objective of investment is just to maintain the current productivity of the farmland. Although economic analysis may show that the project will produce a significant net benefit, the actual results will not be apparent. Potential donors and recipient countries tend to prefer projects that produce immediate economic results, such as employment, exports or new marketing schemes. Thus, a major obstacle to funding soil stabilization and fertility programs is the competition from alternative projects which promise an immediate payoff and a higher profile. If all costs and benefits are taken into consideration, soil stabilization and fertility maintenance programs will compare favorably with alternative uses of scarce investment funds.

Variations on a woodlot program may achieve success. There are proposals underway to initiate a village woodlot program. Office National du Développement des Forêts (ONADEF) has approached the Peace Corps with a request to fund and support several projects. A great deal of skepticism surrounds these programs because of past failures. The biggest problem springs from land tenure practices: The villagers must do the work and the chief gets the trees when they are ready for harvest. In addition, suitable land is scarce.

- One observer suggested that a better alternative would be to give a farmer 10-15 trees a year for 10 years, to plant and tend on his own farm. This not only solves the tenure problem, but staggers the harvest so that in 5 or 10 years, 15 trees are ready to harvest for 10 years in a row. A farmer with 100 simultaneously mature trees may find not only that it is difficult to find the time to harvest and process them, but that the quantity of each harvest might depress prices in the local market.

- One observer suggested that credit for fertilizer and tools purchases be linked with conservation practices in the farmfield. This is a form of positive re-enforcement that makes sense because fertilizer applied to fields that are not tilled with appropriate conservation practices, washes away and does not produce the response needed to repay the loan.

A key to success is extension of knowledge to as many farmers as possible. Another problem is the lack of extension programs to introduce farmers to the latest production and conservation techniques. The techniques of sound land management exist both in the indigenous population and in the research community. Extension programs exist in some AID projects and as part of some of the parastatal programs. The NCRE Project incorporates in its programs a Testing Liaison Unit which works with farmers, credit unions, and parastatals. Some parastatals, such as the Société du Développement du Coton (SODECOTON), have large extension programs that not only provide inputs (improved seed, fertilizer and credit), but also offer technical information and market the final product. The need still outstrips the capacity of exiting programs. Additional programs to transfer technical knowledge to farmers, who are the practitioners in the field, could be initiated and supported on as many fronts as possible.

The Mission could consider funding IITA to continue NCRE at a reduced level. The National Cereals Research and Extension Project (NCRE; 631-0052) is beginning its third and probably last phase. Having successfully improved the production capability of several cereal crops, it has moved to focus on techniques associated with sustainable agriculture (e.g., agroforestry and alley cropping). However, project personnel doubt that agroforestry techniques that significantly improve crop production can be developed quickly.

The issue of agricultural sustainability should also consider institutional sustainability and the closure of this project so that research results and the institutional building that has occurred are not lost. Funding IITA to continue the program with a much reduced expatriate staff is an option that could provide a smooth low-cost transition into a more sustainable organizational structure of IRA.

USAID could consider funding research at IRA and the University Center of Dschang more directly by following a grant system similar to that used in US universities. USAID could fund solicited or received proposals from private, governmental, or donor

client researchers directly, with a negotiated percentage of the grant going to the host institution. The funding mechanism could significantly supplement the income of good researchers, thereby providing incentive to attract bright young students into research. So long as the researchers do acceptable work, they will continue to receive funding for more and larger projects. This mechanism will direct research toward needed activities; it will also allow competent manager/researchers to direct more efficiently the activities of less skilled colleagues through formal or informal subcontracts.

Action could focus on extending ROTREP research to practical applications for functioning businesses. The Tropical Root and Tuber Research Project (ROTREP; 631-0058) has greatly improved root and tuber propagation techniques with methods possible for small business in Cameroon to replicate. Extending this technology from research into functioning businesses will allow farmers to increase food production without expanding cultivated area, thereby contributing directly to the Development Fund for Africa's strategic objective three.

USAID could support development of improved distribution systems for agricultural chemicals, as well as national and local plans for integrated pest management. The Fertilizer Sub-Sector Reform Project (FSSR; 631-0053) has succeeded in improving the distribution of chemical fertilizers. However, more fertilizer is needed than can be supplied, especially for maize growers. Fertilizer distribution could be improved by including retailers in the sale of fertilizer which would increase its availability and could better provide more convenient packaging (Baker, 1991).

1.7.4 Forestry Sector

Donor promotion of improved coordination and of policy and institutional reform could benefit the Forestry sector. The TFAP, coordinated by the United Nations Food and Agriculture Organization (FAO), attempted to provide Cameroon with a more global response to the critical issues on forest resource management. However, it possessed several flaws:

- In focusing on commercial extraction, it ignored the full complexity of the situation.
- It paid only lip service to biodiversity.
- It failed to engage PVOs and NGOs in the issue.
- It appears to be long on generalities and short on substance that can actually be transferred into projects.

- The program was not oriented towards on-the-ground assistance to the indigenous population to improve their tropical forest use and management practices.

Coordination of policy reform across sectors and institutions has the potential of maximizing the benefits of any individual reform. In the forest sector, the absence of a coordinated approach to policy and institutional reform will inhibit private sector participation. The opportunity for donor involvement in promoting coordination is clear. The potential benefit to the recipient and others involved in the process can be measured in terms of the efficiency in the production and distribution of social rents through a liberalized, largely market-driven economy.

Cameroon remains heavily dependent on primary exports and on largely foreign financed investments activity to establish and sustain growth. Fiscal balances in recent years have fallen below even those of the early 1970s. The country remains basically low in tax revenue, savings, and investments, and high in its external dependence.

Specific actions could be reviewed. To foster forest industry development, the following items warrant further review:

Policy and legislation development ought to link responsibilities among participants in greater detail. Otherwise, each remains unable to assess the potential for capturing their respective interests. This situation will measurably retard the development of both the industry and the forest resource.

The legislation development process ought to be redesigned so that all members of the forestry constituency may exchange information and interests opportunely. Currently no vehicle for this dialogue exists.

A Forest Policy Manual should be developed to provide a master reference against which to establish, implement, and measure the performance towards the achievements of Cameroon's goals for the development and maintenance of its forest resource.

Legislation should enable the creation of a more independent forestry administration to enhance its legitimacy, to render it more visibly accountable, and to match its structure more closely to its necessary functions.

Donors could support projects that will improve the calibre of the estimates used to calculate sustainable economically recoverable timber volumes.

Greater emphasis could be placed on market influences in directing the flow of timber resources.

Measures could be fostered which encourage private sector entrepreneurial development in the industry.

1.7.5 PVOs and NGOs in Natural Resource Management

In light of the GRC's lessening ability to effect change and protect resources in local communities and nationwide, NGOs and PVOs are coming to play an increasingly important, grassroots role. USAID has an opportunity to support the actions of PVOs and NGOs and to increase their technical competence in the following areas.

Government policy should be restructured to create a better environment for international, indigenous, rural and village organizations.

Present legislation for NGOs should be reviewed.

USAID could encourage collaboration between NGOs and government agencies through financial information and through training workshops which bring NGOs, research institutions and government agencies together.

USAID could support an increase in NGO small-scale project development with long-term sustainability and viability. This will avoid repeating heavy bureaucratic structures among NGOs.

The Mission could encourage partnership participation among NGOs particularly between international, indigenous NGOs with experience in the field and local associations which suffer from managerial, skill and manpower shortages. The long-term goal is to ensure the development and self-sustainable capacities of local NGOs.

The Mission may wish to avoid direct financial intervention through NGOs and PVOs (as has been the case) without sufficiently developing the human resources management, technical expertise and organizational capacities of these institutions.

USAID could work in partnership with NGOs, government organizations, and resource user organizations to institute a consultative process, promoting dialogue and reflective analysis as an integral component of NRM.

The Mission could support a movement to consistency in legislation pertaining to NRM across the involved line ministries in Cameroon: Agriculture, Tourism, Mines, Water and Energy, Plan and Education.

USAID could provide NGOs and grassroots-level farmer/village associations and federations with the technical and managerial skill to succeed.

The Mission could support innovative micro-level projects testing new technologies or methodologies which could manage natural resource more sustainably and promote equitable development.

USAID could promote skill transfer between international and national NGOs.

The Mission could explore the feasibility of channeling funding increasingly through NGOs to achieve development objectives, as an alternative or complement to channels to government organizations.

USAID could develop a long-term strategy (5 - 10 years) for funding of an NGO program in natural resources management.

The Mission could provide both the flexibility and consistency in committed programming to advance the community's capability to contribute to sustainable development in Cameroon.

1.7.6 Biodiversity and Nature Tourism

Multi-disciplinary environmental studies should be treated as a valued and valuable contribution. Environmental management problems require a multi-disciplinary approach. University graduates schooled in single disciplines such as forestry or agriculture do not necessarily have the knowledge needed to formulate solutions to these problems. Funds could be found to support students willing to major in environmental studies. Although there appear to be funds for students to study agriculture, forestry or other hard sciences, sponsors need to understand that environmental studies is a legitimate pursuit in developing countries.

A standing inventory of wildlife and carrying capacity, by park, could be undertaken. National park management does not have a standing inventory of the animals within each park. They have not systematically determined the carrying capacity of the parks and the surrounding area. This is a first step towards setting up a park management plan. Only one park has a management plan, and it was not the result of government action but the action of the WWF.

The tourist industry should be privatized. If Cameroon wishes to attract more international tourists, it must be competitive in a world market. Most Cameroon tourist operations are controlled by inefficient parastatals which have overpriced their services. Tourist volume has never reached its potential. Proposals to privatize the tourist industry in Cameroon should be supported in an effort to increase the contribution of the industry to the economy. If the Cameroonian government wishes to turn its wealth of biodiversity into a self-supporting system, these resources must link up with tourism to pay for the expense of preserving and fostering them, as well as controlling them.

Selected other donor activities may not need USAID support. USAID/Cameroon is supporting the Wildlife Conservation International (WCI; a division of the New York Zoological Society) to conduct forest research and management research in the Korup National Park. The researchers are to obtain information on the park ecosystem to improve park management (e.g., park zoning, tourism development, rural community conflict management). Other organizations (e.g., Overseas Development Organization (ODA), GTZ, WWF-U.K/International) are in the Korup National Park primarily to undertake rural development activities in association with the Park. It appears that the division of donor responsibilities are clear and that all organizations are working cooperatively.

Another National Park contiguous with Korup National Park is located in Nigeria. Activities in both parks are being coordinated by the WWF-U.K. Given that organization's past experience in the management of these two parks, support for regional coordination of the parks by USAID/Cameroon is not recommended.

The current Mission action plan cites Korup as an example of a fairly self-contained PVO activity that does not require intensive use of Mission management time (USAID/Cameroon 1989). This type of PVO-implemented activity is encouraged, although significant expansion will not be possible except as part of a larger (perhaps umbrella) program.

Mount Kupe

USAID could assist in supporting the development of a park or preserve at Mount Kupe. On December 4, 1989, Dr. Michael Rans, Program Director of International Council for Bird Preservation (ICBP) in Girton, Cambridge, submitted a proposal for a forest conservation program at Mount Kupe. He sought Mission approval for consideration of project funding by USAID/Washington. Key objectives were:

- gazette the forest as a protected area,
- plan for land-use management,
- negotiate forest protection measures,
- study the ecology (e.g., of the Mount Kupe bushshrike, land cover conversions, and vegetation and soils distributions),
- establish a conservation education program (e.g., at GSS Nyasoso school), and
- promote sustainable use of the forest and forest products (e.g., tourist trail construction, honey).

Tri-National Park

USAID/Cameroon has received a proposal to support the development of a tri-national park in Southeastern Cameroon. USAID could support such an effort in order to provide long-term protection to a relatively untouched area and to promote a regional approach to management and planning.

There are many potential benefits to a regional approach. They include:

- the implementation of biological and field surveys using consistent methodology throughout a region;
- the sharing of information and lessons learned throughout a region; and
- communicating a focused, consistent message by the donors to the PVO community.

The PVOs who intend to implement the Tri-National Proposal understand the importance of establishing both country-specific and cross-border agreements in support of the regional activity. Past discussions with the PVOs have indicated that establishing these agreements has been a priority.

The Tri-National Park proposal (dated February 27, 1991) states that a regional conference is planned in the Central African Republic (CAR) in late 1991. Participants will try to establish an association of representatives of all participating donors, PVOs, and host governments. Holding a regional conference and establishing a coordinating association could be important steps in setting an institutional framework for the proposed project.

According to Mr. Augustine Bokwe, Director of Wildlife and Protected Areas, his office had not yet reached a decision regarding the proposal (August 6, 1991). However, he indicated that he was involved in regional Central Africa coordination activities which could provide support to the Tri-National Park proposal. For instance, the Organization de Protection de la Faune Sauvage en Afrique Central, composed of representatives from Cameroon, Chad, CAR, and Congo, meets once a year to discuss conservation issues and opportunities.

The international community has expressed interest in the Tri-National Park proposal. USAID has a mandate to undertake tropical forest management activities. If the host country governments and international community establish the necessary agreements, the proposed activity could present an important opportunity for USAID/Cameroon.

A comprehensive survey of forest elephants would be useful for conservation purposes in central Africa. USAID/Cameroon might consider inviting a modest proposal for such work in Cameroon. On February 21, 1991, WCI sent a proposal draft ("A census of the forest elephants in central Africa") to USAID's Africa Bureau. The draft requested $1,420,960 for a 3-year study in six countries from Cameroon to Zaire. The Cameroon portion of $137,060 would include purchase and operation of a vehicle, and wages for five local workers for 2 years, but not wages for a scientist. WCI has also submitted a proposal for a regional elephant survey to the European Economic Community (EEC) (Bill Weber, pers. comm.).

According to the proposal, the census of elephants will be primarily by counting droppings found along transects and adjusting for defecation rate and rate of fecal decay. Some detailed surveys of this type have already been conducted in the region. Results are to be integrated with AVHRR imagery in a geographic information system to produce elephant distribution maps. Surveys will also contribute data on vegetation.

A comprehensive survey of forest elephants would be useful for conservation purposes in central Africa. WCI is a logical organization to implement such a survey. Whether this proposal should be funded would depend upon who will actually do the work, what proportion of the area will already have been covered by recent and comparable surveys, development of a better and more detailed proposal for the use of satellite imagery and a geographical information system, and justification of the need for a full-time, mid-level project coordinator for 3 years.

USAID/Cameroon might consider inviting a more modest proposal for work in Cameroon. Such a proposal should build upon the ongoing surveys at Korup National Park (Powell 1991) and the recent surveys in the southeast (Stromayer and Ekobo 1991), both of which have been done under contract to WCI.

As an intervention to support individual citizens' standard of living and a disincentive to unauthorized use of park resources, USAID could support activities which will enhance nature-based tourism, so long as they are compatible with conservation goals for tropical forests and biodiversity.

The Mission has two main avenues of opportunity for future contribution to the conservation of biodiversity and tropical forests in Cameroon.

First, the current portfolio can be maintained through renewed support for inventory and training at Korup National Park and continued funding for biological degrees at Dschang.

The portfolio could also be strengthened by more direct association of two agricultural and potential agroforestry projects, NCRE and ROTREP, with protected area projects at Kilum, Korup, Kupe, and Limbe in the western mountain forest and southwestern lowland and evergreen forest.

Second, the planned Natural Resources Management project can be used to fund new activities. The moderate budget of the project, the extensive investment of the Canadian government in the forestry sector, the uncertainty currently attached to potential policy reforms, the relative expertise of USAID in the agricultural sector, and the limited support now available for direct conservation of biodiversity and tropical forests in Cameroon all suggest that funding might be most effectively used to support one or two integrated conservation and development projects associated with protected areas. The ideal project might gather an indigenous PVO for conservation education, an international conservation organization for park management and inventory, and a U.S.-funded development organization for rural development.

Unfortunately, no ideal project has been proposed. The Mission has before it one proposal for integrated conservation and development, in the extreme southwest. It appears to be the consensus of the Mission that the proposal is worthwhile, though it could profit from revision. Cooperative design of this or a different project might help tailor it to Mission objectives and minimize future Mission management requirements.

1.7.7 USAID/Cameroon Opportunities For Complementary Activities With Other Donors

There is a clear need to establish formal and direct links between forestry and agricultural research which will:

1. **address soil fertility and erosion;**
2. **decrease loss of vegetation; and**
3. **provide farmers living near protected areas with economic alternatives.**

USAID has a clear mandate to undertake tropical forests and biodiversity activities. USAID/Cameroon could focus its research efforts (e.g., agroforestry) on providing rural communities associated with protected areas with agricultural and economic alternatives.

While other donors are undertaking these activities in Korup National Park, there are opportunities for forestry and agricultural research in other parts of the forest region. Some of these include:

- The International Center for Research on Agroforestry (ICRAF) -- forest zone alley-cropping and improved fallow with multiple-use trees in Nkolbisson and the departments of Dja and Loboe.

- The International Institute For Tropical Forestry (IITA) -- demonstration experiment to study fallow practices in dense forests, in Mbalmayo and Nkolbisson. USAID/Cameroon could work in cooperation with research organizations and other donors to provide rural communities in surrounding forest areas with economic and agricultural alternatives to unsustainable practices.

The following chapters present the background information and analysis which supports the findings and options contained above.

2.0 STATUS OF BIODIVERSITY AND TROPICAL FOREST RESOURCES IN CAMEROON

2.1 COMPONENTS OF BIODIVERSITY IN CAMEROON

Biodiversity is the genetic, morphological, and behavioral diversity within and among the wild, native, biological species of an area. In their natural state, physical and biological elements are usually organized into complex ecological systems whose organization and function constitutes a third aspect of natural resources. Because this diversity is a major determinant of ecosystem function, biodiversity also includes the diversity of biological processes within and among ecosystems (e.g., Wilson 1988; Stuart et al. 1991).

Cameroon is biologically very diverse in plant and animal species and in the wide range of ecological communities. Major areas of special significance for the conservation of biodiversity and tropical forests include:

- **the mountain forests** of the western mountains, with an exceptional complement of rare and endemic species;
- **the lowland evergreen forests of the southeast**, with high biodiversity and unusually high densities of elephants, gorillas, and other forest animals; and
- **the lowland evergreen forests of the southwest**, with highest species richness.

Areas of the **northern savanna** are also important, with their remnant populations of large mammals such as rhinoceros, elephant, and eland.

The following sections delineate the richness and significance of the tropical forests, the ecological communities, and the wildlife species present in the country.

2.1.1 Tropical Forests

Tropical forests are indigenous, non-human-made, ecological communities located less than 23°30' from the equator; they are areas in which the vegetation is dominated by trees or would be so dominated if not for human intervention.[1] More than 300 species of trees have been identified in Cameroon. As ecological communities, tropical forests include animal wildlife, partially physical features such as forest soils, and ecosystem functions such as regulation of streamflow and erosion.

---

[1]This report includes in the definition both present and former natural forest lands, as conservation of tropical forests in heavily exploited regions may depend almost entirely upon the restoration of forests where they once occurred.

Where forest grades into grassland or bushland (as at the northern edge of the country's forests), the boundary between forested and unforested lands may be indistinct. Closed forest (forêt dense) is generally distinguished from open forest (forêt claire) and non-forest by the extent of tree canopy cover: the proportion of ground surface vertically shaded by trees during the season of greatest leafiness. Open forest is defined here as having 10-50% cover. Closed forest is defined as having more than 50% tree cover; the terms "rainforest" and humid forest" generally refer to closed forest, more often at low (rather than mountainous) elevations. In Cameroon, the boundary between lowland and mountain forest is generally considered to lie between 1000 and 2000 m above sea level, depending on latitude (Gartlan 1990). Both closed and open tropical forests are probably covered by the 1987 Amendment of Section 118 of the Foreign Assistance Act.

It should be noted that the legal definition of forests in Cameroon is extremely broad. Law 81-13 defines forest to include all vegetated lands capable of furnishing wood or non-agricultural products, or of providing habitat for wildlife, or of affecting soil, climate, or hydrology (GRC [no date]). This definition includes natural grasslands and shrublands, which are not tropical forests in an ecological sense.

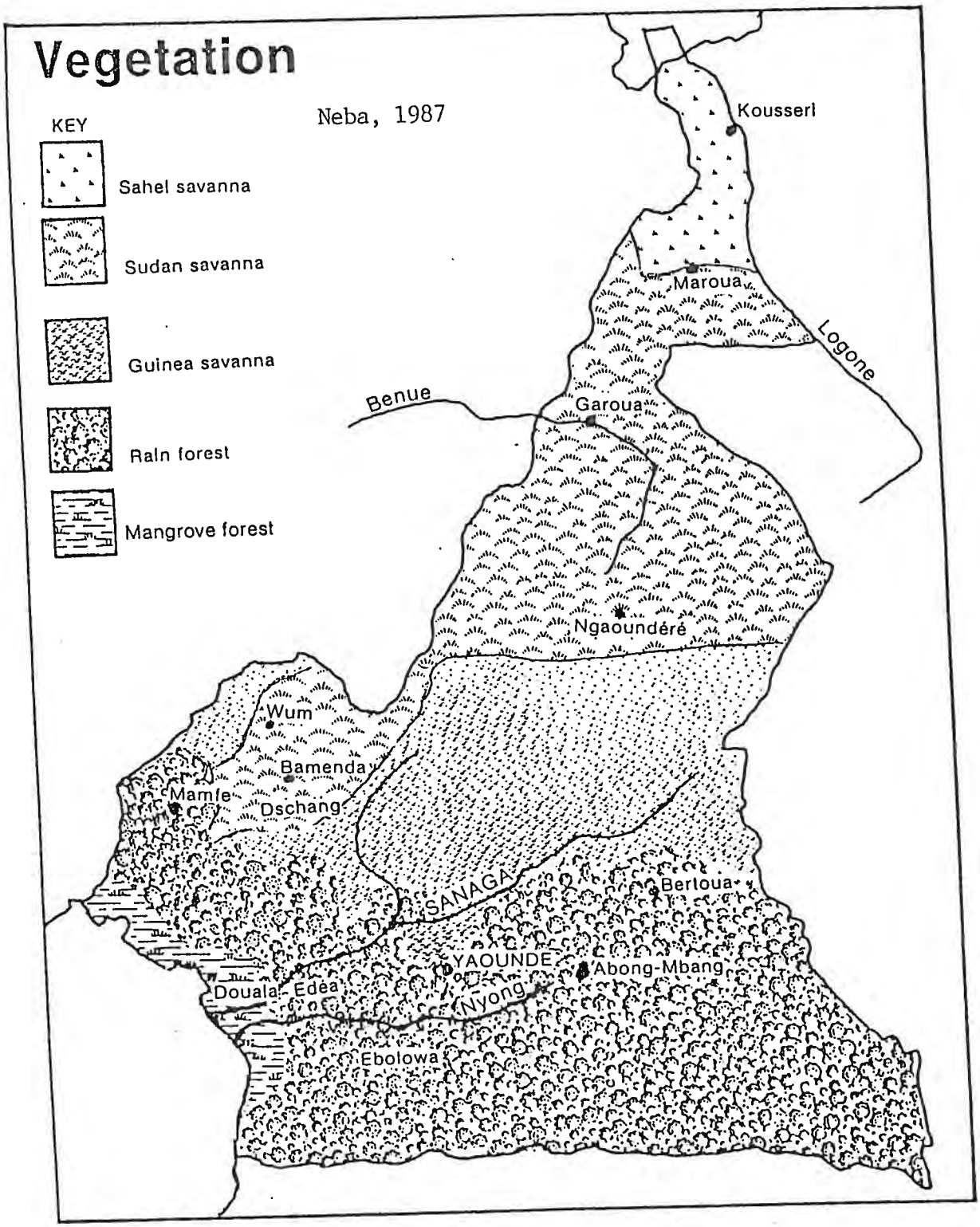
2.1.2 Ecological Communities

A wealth of species is supported not only by the lowland, humid tropical forests, but also by contrasting ecological communities along marked gradients of biogeography, elevation, and rainfall. The country's seven major ecological zones are climactically determined. They are:

- evergreen rain forest
- deciduous moist forest
- semi-deciduous moist forest
- mangrove forest
- Guineaian savanna
- Sudanian savanna
- Sahelian savanna (see Figure 2-1).

Rainfall ranges from 630 mm/yr at Kousseri on the Lake Chad Plain to 10,000 mm/yr at Debundscha on Mount Cameroon. Most of the country receives between 1500 and 2000 mm/yr. As rainfall decreases with distance from the coast, the vegetation passes from evergreen forest to grassland. Cameroon's wide range in precipitation and relief (up to 4,095 m at the peak of Mount Cameroon) support a diversity of plant species and wildlife.

Cameroon has often been called Africa in miniature because almost all of the African climatic zones can be found here. For instance, the western lowland forests of Cameroon are biologically similar to the lowland humid forests of western Africa. Eastern lowland forest species, however, more closely resemble those of the central African


Vegetation
Neba, 1987
KEY
Sahel savanna
Sudan savanna
Guinea savanna
Rain forest
Mangrove forest
Kousseri
Maroua
Logone
Benue
Garoua
Ngaoundéré
Wum
Bamenda
Mamfe
Dschang
SANAGA
Bertoua
YAOUNDE
Abong-Mbang
Douala
Edea
Nyong
Ebolowa

lowlands. High elevations in the western mountains of the country, the tallest in western Africa, support mountain and alpine communities.

Cameroon's four major types of vegetation are **savanna** (including grasslands, brushlands, and open forests) and three types of closed forest, **mountain forest, lowland semi-deciduous forest,** and **lowland evergreen** forest. Each is individually significant for biodiversity conservation and is protected to differing degrees.

- Because of its small total area, almost complete lack of protection, and highly restricted populations of endemic birds, bats, mice, and insects, the **mountain forest** is especially vulnerable.

- The **northern savannas** have fewer species but contain large animals such as eland, buffalo, giraffe, elephant, and rhinoceros that engage human interest (Douada 1988).

- The **lowland, humid forests of the south,** the rainforests, contain very large sets of species of plants and animals.

Two major subtypes are particularly significant for biodiversity and tropical forests:

- the southwest lowland evergreen forests (sometimes known as Biafran or Guinean forests because of the species they share with west Africa), and

- the southwest lowland evergreen forests (termed *Congolian* because of their affinities with central Africa).

All four major vegetative communities have been severely degraded over more than half of their original area.

Other important ecological community types include mangrove swamps, lakes, coastal marine zones, and alpine meadows and heaths (Gartlan 1989; Stuart et al. 1991). A national vegetation map based on satellite imagery (FAO 1980) and a continental map based on botanical records (White 1983) recognize dozens of ecological communities within Cameroon. The most extensive treatment, that of the late French botanist Letouzey (1968, 1985a,b), recognizes 267 categories, including those introduced by humans.[2]

---

[2]Additional sources of information on biodiversity and tropical forests in Cameroon include reviews of the forest sector (Burns 1983; Catinot 1986; Poore 1987; von Fürstenberg 1987; Food and Agriculture Organization 1988; Rietbergen 1988; World Resources Institute 1988; France Ministry of Cooperation and Development 1990); and more general reviews of the country (Food and Agriculture Organization 1981; Hazelwood and Stotz 1981; International Union for the Conservation of Nature 1982; Cameroon Ministry of Plan 1986;

2.1.3 Species Richness

Cameroon is rich in species (Haltenorth and Diller 1980; Vivien and Faure 1985; Stuart 1986; Kingdon 1989; Reid 1989; Dejaifve 1991; Stuart et al. 1991). The country contains approximately 9000 known species of plants, 29 species of primates, 297 total species of mammals, 848 species of birds, and 39 species of swallowtail butterflies. Only four sub-Saharan African countries contain a higher number of plant or mammal species (Stuart et al. 1991).

Cameroon is also rich in species of particular interest to conservation:

- endemic species (those confined to a relatively restricted geographical area);
- threatened species (those found in such small numbers as to be threatened with extinction; and
- keystone species (those with particularly important ecological roles.

Endemic species

Cameroon shelters at least 156 species of plants, 63 amphibians, 3 rodents, and 1 bat (Stuart et al. 1991). The mountain forests of western Cameroon, plus small adjacent areas of Nigeria and the island of Bioko, are a continental endemic center for small animals. Twenty-two bird species are found only in these forests (Stuart 1986).

Threatened and Keystone species

Cameroon contains populations of over 40 species identified as **globally threatened:** threatened with extinction throughout their range (World Resources Institute 1990). These include 18 mammals, 16 birds, and 5 reptiles. Among them are three species of great international and Congressional concern:

1. **The Black Rhinoceros (Diceros bicornis).** Bouba-Njida and Bénoué National Parks shelter Africa's western-most population of black rhino (Cumming et al. 1990; Stuart et al. 1991). This population, which may be a distinct subspecies, is in immediate danger of extinction at the hands of poachers. Two years ago, Alers (1990) estimated that 50 animals remained. This spring, Planton (1991) estimated that fewer than 30 animals were still

---

Economist Intelligence Unit 1986; International Institute for Environment and Development 1987; Commission of the European Communities 1988; World Bank 1988; Lemay and Bacle 1989; Centre de Coopération Cameroun Canada 1991).

alive, half of them in or near Bouba-Njida. He proposed live capture and enclosure to ensure survival of the population.

2. **The Gorilla (Gorilla gorilla).** The gorillas of Cameroon belong to the subspecies Gorilla gorilla gorilla, the western lowland gorilla. An isolated population of gorillas occurs in the north, in Takamanda, and larger populations occur in the south (Stuart et al. 1991). Densities are particularly high in the extreme southeast (Stromaker and Ekobo 1991).

3. **The African Elephant (Loxodonta africana).** The African elephant is both a threatened and a keystone species. It has received special recent attention from biologists in central Africa (e.g., Eils and Ekobo [no date]; Michelmore et al. 1989; WCI 1989; Powell 1991; Stromaker and Ekobo 1991). Both the savanna subspecies (Loxodonta africana africana) and the forest subspecies (L. a. cyclotis) occur in Cameroon. The total population size may be 15,000 to 36,000; about half may be in the East Province (Ekobo et al. 1991; Gartlan 1991). Although the ban on commerce in ivory under the CITES treaty has probably reduced the poaching of elephants in the forest zone of Cameroon, poaching occurs throughout their range within the country (Ekobo et al. 1991). Densities of elephants decline sharply near villages (e.g., WCI 1989; Barnes et al. 1991), suggesting that the spread of habitation that typically follows commercial exploitation of forests may shrink the range of the elephant even when suitable habitat remains.

2.2 CURRENT AND POTENTIAL PARK/RESERVE SYSTEM

Efforts to preserve and protect the biodiversity, ecological communities, and wildlife of Cameroon as a resource began with establishment and protection of areas of the country by giving them official status as Parks or Wildlife Reserves. The parks are defined below; the policy relating to their protected status is discussed in **Chapter 4.0.**

The present system of protected areas in Cameroon officially includes 7 parks and 9 wildlife reserves (MacKinnon and MacKinnon 1986; Gartlan 1989; Stuart et al. 1991; Table 2-1). Six of the seven parks are in the savanna zone. These include one large (> 1,000 km^2) and two small (< 100 km^2) parks in the savanna (sahelian, or scrub subtype), and three large parks in the savanna (Sudanian or wooded subtype). The remaining park is large and in the humid evergreen forest (Guinean or Biafran subtype).

Eight of the nine wildlife reserves are in the dense forest zone (Table 2-2). However, these include two that have been destroyed, one that has been degraded over about one-half of its area, one in which timber concessions are being granted, and one in the process of declassification (Gartlan 1989). The wildlife reserves that have apparently escaped massive degradation consist of a large reserve in the lowland evergreen forest

TABLE 2.1

	Community	Area (km^2)	Major degradation	International aid
National Parks				
Bénoué	savanna	1,800		
Bouba-Njida	savanna	2,140		
Faro	savanna	3,300		
Kalamaloué	savanna	45		
Korup	evergreen forest	1,260		
Mozoko-Gokoro	savanna	14		
Waza	savanna	1,700	natural flooding impaired by dam	Univ. of Leyden, USFWS/Pecten Co.
Wildlife Reserves				
Campo	evergreen forest	2,700	opened to logging	
Dja	evergreen forest	5,260		EEC
Douala-Edea	evergreen forest	1,600	in process of partial declassification	
Kimi River	savanna	56		
Lake Ossa	evergreen forest	40		
Mbi Crater	evergreen forest	4		
Nanga-Eboko	evergreen forest	160	may have been totally destroyed	
Sanaga	evergreen forest	?	may have been totally destroyed	
Santchou	evergreen forest	70	45% destroyed	

(Congolian subtype), a small reserve in the lowland evergreen forest (littoral subtype), a very small (< 10 km^2) reserve in the lowland evergreen forest (premontane subtype), and a medium-sized (100-1,000 km^2) reserve in the sudanian savannah. Waza National Park and Dja Wildlife Reserve are UNESCO biosphere reserves.

Two areas are under official consideration for national park status (Gartlan 1989). One is the present Dja wildlife reserve. The other, Mbam et Djerem (3,532 km^2), would be the only protected area in the lowland semi-deciduous forest. A proposal for a park in the adjacent area of Panjar-Djerem has apparently been dropped in favor of Mbam et Djerem.

Three areas are under consideration for wildlife reserve status: Lake Lobeke (920 km^2), Nki (1,950 km^2), and Boumba Bek (2,330 km^2). These are all in the lowland evergreen forest (Congolean subtype) of the southeast. They are the areas of the proposed Cameroonian component of a Tri-National Park (World Wide Fund for Nature Cameroon and WCI 1991).

The National Parks and reserved areas of Cameroon are national treasures worth preserving: they offer unique biotic and historic values; they also could generate a cash flow that could make a real contribution not only to the economy of the community but to the national treasury as well. These areas contain many of Africa's large mammals and support several rare and endangered species which cannot be viewed in their natural habitat any where else in the world. If protected and managed, these areas could accommodate a substantial increase in tourism and the region and the nation would reap the benefits of this additional economic activity.

2.3 CONFLICTS WITH BIODIVERSITY AND TROPICAL FORESTS

2.3.1 Direct Threats

Deforestation, poaching, and water management schemes directly threaten biodiversity and tropical forests. The major threat to biodiversity of Cameroon is probably deforestation (Stuart et al. 1991). Cameroon has lost about 60% of its forests, more than any other central Africa country (World Resources Institute 1990). Average annual deforestation during the 1980's was 0.8% of remaining forests, four times as much as any other central African country. Average annual reforestation during this decade was 100 times slower than deforestation (World Resources Institute 1990).

The major causes of deforestation are (1) expansion of cropland and pastureland and (2) logging (Stuart et al. 1991). Agricultural expansion is primarily non-industrial. In the closed forest area, most is probably for subsistence or very small cash crop farms. Wood production in 1985-1987 was primarily for fuelwood (9.4 million m^3 vs. 2.8 for industrial roundwood and 0.7 for processed wood and paper; World Resources Institute

1990). However, production of roundwood has increased twice as fast as that of fuelwood during the last 10 years.

The second greatest threat to biodiversity is probably poaching. Poaching in and around the parks is a lucrative occupation, which attracts not only local hunters but cross-border raiders from Chad and Nigeria. Elephants, rhinoceroses, and some other large animals are hunted mainly for the ornamental or medicinal value attached to specific body parts. The price of ivory has actually increased since ivory sales have been banned by CITES. The average tusk (about two kg) and ivory is worth approximately CFA 5,000 per kilogram. Faro Park, an area without marked boundaries or protection, has a small population of rhinos. The current market value of a rhino horn is CFA 250,000. In an economy where unskilled manual labor commands only CFA 1,000 per day and guards are paid an average of CFA 1,500 per day, poaching becomes economically attractive.

In addition, monkeys, small ungulates, and rodents are hunted mostly for meat (Stromayer and Ekobo 1991). Bushmeat hunting is practiced for commerce, as well as for subsistence. Bushmeat brings a relatively high price per pound, and the fall in the prices of cocoa and coffee has made bushmeat the primary food product that is considered to be worth transporting by foot from some remote villages (Katherine Craig, pers. comm.).

Where human populations are sparse, even commercial hunting of some wild species may be sustainable. Stromayer and Ekobo (1991) conclude that the hunting of duikers in the extreme southwest does not presently threaten their populations. However, poaching for bushmeat has rendered some species, such as the giant pangolin, locally rare or extinct (Felix Okun, pers. comm.).

Additional threats, particularly in the north, include water management schemes. The alteration of natural flooding by a dam built in 1979 to promote rice cultivation in the plain of the Logone River has had negative effects on the wildlife ecology of Waza National Park (Eils and Ekobo [no date]). The park conservator of Waza has cited the seven major management problems as drought, poaching, feral dogs, bovine plague, cattle grazing, overpopulation of elephants, and the existence of two villages within the park (Daouda 1988).

2.3.2 Indirect/Causative Threats

Indirect threats are no less significant. The natural resource base of Cameroon is indirectly but powerfully affected by the political, economic, and policy-making structure of the country. Cameroon experienced a period of prosperity in the later 1970s and early 1980s, a phase which permitted growth of subsidies and a large bureaucracy. An abrupt and continuing economic change has reduced funds available for preservation, protection, and renewal of resources. In addition, policies in place focus on exploitation of resources.

The government has cut operating funds for NRM, and regional office are not permitted to obtain contributions on their own. The current financial problems of the country (see **Chapter 3.0**) have cut the budgets for parks and protected areas and thus increased the difficulties of managing them. Operating budgets have been cut beyond the bone. It is difficult to carry out even the most abbreviated program. A mechanical failure means that essential equipment is put aside indefinitely. Replacement is postponed and new equipment cannot be considered. Offers to give or loan equipment to specific regional offices must be processed through Yaounde, where they are often reallocated to perceived greater needs. The district offices may not directly deal with any volunteer assistance nor may they petition for outside help.

The parks and wildlife reserves suffer from a chronic lack of material and infrastructure (Gartlan 1989; Augustine Bokwe, pers. comm.). In 1988, Waza National Park had 26 guards, 30 pisteurs, 15 surveillance posts, 160 hotel beds, 124 campsite beds, 6000-7000 paying visitors, 500 km of trails, one vehicle at the disposal of the conservator, and a budget of CFA 30,000,000 (Dauoda 1988).

Financial support of personnel presents a real problem. The forest guards are the front line troops who protect the National Parks from poachers, a real and dangerous threat in most of the parks. Along the main road bordering Waza, a guard and guide were shot and killed by poachers on July 1, 1991. Park guards are under-staffed, under-equipped, and understandably demoralized.

For example:

- Waza National Park (170,000 hectares), has 25 to 30 guards. Each guard must protect an average area of 6,800 hectares. The parks in Kenya have one guard per 1,000 hectares.

- The guards are equipped with World War II Lee Enfield rifles and sent to the field with 5 cartridges. They have the use of a couple of vehicles which are constantly under repair. They have no communication equipment.

- Guards are paid CFA 20,000 to 30,000 a month plus CFA 7500 a month hazard pay. Their hazard pay has been reduced from CFA 15,000 a month because of the current financial crises of the government. In contrast, soldiers who are not currently engaged in combat duty are paid CFA 50,000 per month plus clothes, uniforms and medical needs.

It has been estimated that, to carry out the mission properly at Waza, the park needs 100 guards, uniformed to give them a special identity and to assure them (and others) that their job carries authority and status. They need adequate equipment: modern rifles, ammunition and transportation, and communication equipment. One source of assistance here would depend on the ability to revise the central funneling of donated/loaned

equipment: for instance, sporting arms manufacturers might be willing to donate rifles to guards, if they could make use of the fact that their rifles were being used to protect elephants in Africa. Automobile companies might be willing to donate equipment if they could publish the fact that their 4-wheel drive vehicles are used to protect endangered species in some of the roughest terrain in Africa.

2.3.3 Conflicts with Human Culture and Expectations

The establishment of protected areas has set in motion conflicts with established human uses and customs. These unresolved conflicts--which reach beyond "poaching"--negatively affect both the human communities and the preserves as well.

Establishing protected areas without regard to existing human practices or habitation presents a significant problem. The peoples of Cameroon consider the richly diverse resources of Cameroon--including those areas designated for protection--as a gift of nature which provides them with the essentials necessary to sustain life. Those qualities are still present in the protected areas.

In seeking to define areas for special protection, such areas were originally defined which supported unique biotic environments. Proposals for their preservation were presented to the government. Despite the fact that populations lived in and around these areas, the government drew borders on a map and passed a law stating that agriculture, fishing, hunting, and wood harvesting within the area was prohibited. Thus, all of the activities of the population within the park were suddenly illegal.

Attempts were made to move the encircled population to areas outside the protected zone. Some moved, some refused. Some continue to practice their traditional lifestyles and "prerogatives" which create pressures on the ecosystems within the park. The current park administration holds that all illegal activity should cease immediately and that the remaining inhabitants of the protected areas should be moved.

Opposing views state that individuals who were living within the boundaries of the protected areas at the time when protection was established should be given the right to pursue traditional uses (some agriculture, small game hunting, fishing, and fuelwood gathering), so long as these uses do not threaten the protected area.

From a practical point of view, extending these privileges would create distinct problems. Extension would complicate protection and add to the burden of the guards now protecting the area. It is difficult to distinguish between legitimate visitors to villages within the park and poachers. It is hard to tell whether game currently being killed was legally hunted outside the park and carried to villages within the park boundaries, or was killed within the park. In terms of enforcement and fairness, granting traditional privileges to park inhabitants would be most difficult, and would compound the current volatile situation.

Fostering acceptable cultural changes will require thoughtful development of attractive alternatives. Since most of these individuals have used the protected areas to sustain themselves and families for generations, other attractive options must be developed which will sustain life and culture without impinging on the protected areas. Local residents must be convinced that the benefits to be received from alternative activities and from the reserved area are greater than the benefits realized from pursuing the unauthorized activity.

The benefits of preservation do not readily translate into market values, however. These benefits include flora and fauna, scientific values, and potential medical and genetic stock values. They accrue to the nation and the world community. The costs, however, accrue at the local level.

Benefits to the local population must therefore be tangible and readily perceived. Some options have been successful, but not all of them are still viable. In some cases, **agricultural plots outside the protected area** have been provided. Where the return to these plots can be increased beyond those experienced from fishing, hunting, and agriculture activity within the protected area, they may be successful. In others, the local population has been **employed to manage and guard the area**, activities providing them with an income greater than that foregone within the protected area. (Unfortunately, given the financial problems of the government, the latter approach is not currently viable. See Chapter 3.0.) **Relocation** outside protected areas can be successful, if carried out with sensitivity and community involvement from the conceptual stage through implementation. And, finally, some local residents have been employed as **guides and porters** for tourists and hunters within the parks or hunting areas. They currently are paid CFA 2,500 and CFA 1,500 per day, respectively, which is greater than a minimum wage. If tourism and hunting increased, this activity could provide a good source of supplemental employment.

2.4 OPPORTUNITY: NATURE-BASED TOURISM

Cameroon offers unique attractions to tourists. Parks and protected areas provide many benefits, both tangible and intangible. Tourism represents a benefit that is readily identifiable. It can create side-benefits that radiate though the local communities and region. One of the major tourist attractions in Cameroon are the national parks. Almost all of the climatic zones of Africa can be found somewhere in Cameroon. There are savannahs and mountains, upland forests, tropical forests and Mangroves. Parks are located in each of these regions, preserving the flora and fauna that is indigenous to the zone. Tourists have a wide range of choices in Cameroon and, with a little thoughtful promotion and management, tourism could become a major contributor to the economy.

Tourism is increasing elsewhere. Tourism throughout the world has risen steadily over the last 20 years as the population in the developed world grows older and has more leisure time and disposable income. Tourism in eastern Africa has fallen off lately because

of unrest in the Middle East and the Gulf crises. The number of tourists visiting eastern Africa, however, is expected to continue to climb as the recent unrest is forgotten.

Tourism can contribute directly and indirectly to the economy. Direct contributions include entrance fees, and payments for lodging, food, transportation and miscellaneous purchases. Indirect contributions include spin-off effects, such as indirect employment in the transportation and lodging industry as well as payments to farmers for the food consumed. Table 2-3. shows paid entries to Waza Park over the last 10 years. Admission is paid for the duration of the stay (1 year for local Cameroon Nationals).

Table 2-1 Paid Entries to Waza National Park by Year

1979/80	5730
1980/81	4904
1981/82	5756
1982/83	6733
1983/84	6583
1984/85	6361
1985/86	6548
1986/87	6996
1987/88	5586
1988/89	5138

The average attendance at Waza Park is approximately 6000 per year. Assuming that the entrance fee is CFA 2500, the total gate receipts are CFA 15 million. This is only a small part of the value that these tourists contribute to the economy. Table 2-2 shows the summary results of a survey taken in 1988/89 of 22 hotels in the Extreme North Province.

Table 2-2 Hotel Receipts of Expenditures 1988/1989 in the Extreme North Province		
Item	In CFA	Other expenditure per CFA 1,000 Room Rental
Room Rental	222,657,125	
Breakfast	24,032,352	108
Restaurant	129,067,246	581
Bar	65,374,138	293
Tele-Telex	14,569,230	63
Other	8,202,690	8
TOTAL	463,902,781	1,053

Thus, for every CFA 1,000 that is spent in hotel accommodation, CFA 1,053 is spent on other services in the hotel. Hotel accommodations in Maroua, occupied by the team were approximately CFA 12,000 per night. Waza attendance averages about 6,000 per year. Table 2-3 below estimates receipts based on two assumptions: that half of the individuals entering Waza were couples or had children occupying the same room (so that only 3,000 rooms were needed to accommodate the tourists) and that the average stay was 2 days, so that the tourists paid for 6,000 room nights. Table 2-5 summarizes the total receipts of 6,000 tourists entering Waza Park, given these assumptions.

Table 2-3 Estimated Receipts from 6,000 Tourists Attending Waza Park (CFA)	
Room Rental	72,000,000
Breakfast	7,756,000
Restaurant	41,832,000
Bar	21,096,000
Tele-Telex	4,536,000
Other	576,000
Total	147,796,000

Under this estimate, the minimum contribution of 6,000 tourists to the region surrounding Waza park is 148 million CFA per year. Tourists will also purchase transportation, souvenirs and pay CFA 15 million to get into the park. Given this

magnitude of contribution to the economy from tourists that currently using the park, the CFA 13 million budget of the park appears modest.

The potential of increasing the number of international tourists is an opportunity missed in Cameroon. State-owned and -managed hotels set the price of lodging. The cost of a hotel is five to ten times higher than the cost of a hotel room of a similar class in Nigeria. The roads, communications and infrastructure around the parks are second class. Promotion of the unique vacation opportunities in Cameroon is almost non-existent. Tourism has the potential of becoming a significant contributor to the economy of Cameroon, but it would have to be managed and promoted.

Option:

- As an intervention to support individual citizens' standard of living and a disincentive to unauthorized use of park resources, USAID could support activities which will enhance nature-based tourism, so long as they are compatible with conservation goals for tropical forests and biodiversity.

3.0 ECONOMICS REPORT

3.1 ECONOMIC BACKGROUND

Cameroon prospered from 1978 - 1985. The economy of Cameroon is one of the more developed and diversified in western Africa. In terms of gross national product per capita, Cameroon is one of the richest countries of West Africa with US$ 960 in 1987 (see Table 3-1, below). An abundant selection of agricultural products not only meets the needs of Cameroon, but permits export of a significant quantity of surplus products. Until 1978, the country's economy was based on the agriculture sector. Agricultural exports, primarily cocoa and coffee, provided a base for steady growth.

In 1978, oil production increased substantially. During the next 10 years, the economy grew strongly and rapidly. Between 1980 and 1985, it grew 9 percent a year in real terms. This growth was based on the production of oil, the value of which had increased to 19 percent of Gross Domestic Product (GDP) by 1985. Supported by increasing commodity prices, agricultural product exports also increased dramatically. Thus, by 1985, Cameroon had a strong, growing economy, a growing per-capita income, a balanced budget, and no external debt.

Table 3-1 Gross National Product Per Capita (1987)

Nation	GNP per Capita (US$)
Cameroon	960
Congo	870
Côte d'Ivoire	750
Liberia	450
Nigeria	370
Central African Republic	330
Ghana (1985)	320
Benin	300
Sierra Leone	300
Togo	290
Niger	260
Mali	210
Chad	150
Zaire	150

Government services and subsidies distorted economic markets. With surplus revenues and increasing taxes generated by a growing economy, the government also increased the civil service payroll, social services, and subsidies for products. For instance, agricultural prices were supported by subsidies; parastatal industries were also established in a number of sectors. The civil service employment and their salaries increased substantially. The agriculture sector came to depend upon price support subsidies. The parastatals, without sufficient profit motive to guide their activities and investments, became more and more unprofitable.

The comparatively high public sector wages distorted wage levels throughout the economy. Thus, private entrepreneurs had to compete with the public sector by offering wages higher than their fair market price. With profits allocated to labor, returns to private industry were diminished. Investment was dampened, employment opportunities decreased, and growth was stifled.

Market price drops in 1986 severely reduced national income. In 1986, the world prices of oil, cocoa and coffee, Cameroon's three major exports, dropped dramatically. Export revenues followed. GDP, which had grown dramatically over the previous years, dropped about 10 percent during fiscal year 1986/87. Declines in the GDP continued as did declines in GDP per capita. In 1990/91, the GDP decline was estimated to have been approximately 2.6 percent (see Table 3-2).

Table 3-2 Percent Change in Gross Domestic Product and GDP Per Capita for Fiscal Years 87/88 through 90/91.

Gross Domestic Production	87/88	88/89	89/90 (est.)	90/91 (est.)
Percent Change	-8.5	-2.4	-6.3	-2.6
Per Capita	1,262	1,162	1,083	1,068

Source: U.S. Embassy, (Information on File)

Through 1985, Cameroon maintained a current account surplus supported by oil, coffee, and cocoa exports. In 1985, these products accounted for 85 percent of the value of the country's exports and over 50 percent of it total revenue.

Between 1984 and 1986, however, oil revenues dropped from CFA 722 billion to CFA 419 billion. By 1987, they had dropped still farther, to CFA 233 billion. Yet the volume exported only went down about 7 percent. Coffee and cocoa export revenues declined from CFA 216.7 in 1984-85 to CFA 113.6 in 1987-88, while export volumes remained approximately constant. 1985's current account surplus of 1985 dropped to a deficit of approximately 8.5 percent of GDP during the years 1986-88.

In consequence, tax revenues dropped by more than one third. The government, which had balanced its budget in 1985, now incurred a deficit which peaked at almost 12 percent of GDP in 1986-87.

The GRC cut support funds, creating a liquidity crisis. In trying to solve its budget problems, the government chose to default on payments to local suppliers. It also decided not to pay agricultural support program subsidies and to cut payments to money-losing parastatals. Both farmers and suppliers defaulted on bank loans. This created a liquidity crisis endangering the banking system. The government cut operating funds to government departments: civil servants were paid, but did not have the resources to carry out their mandates.

The International Monetary Fund (IMF) and World Bank offered help, in return for reforms. The government also turned to the International Monetary Fund and the World Bank for assistance. In September 1988, the IMF signed a standby agreement with the government; in September 1989, the World Bank agreed to provide a loan under its Structural Adjustment Program (SAP). By signing both of these agreements, the GRC agreed to adjust its programs and activities to remove the structural constraints that inhibited the return to a healthy economy and growth. The government agreed to reduce its control of the economy and to support private sector development. The reform program included a substantial cut in civil service employment and a redirection of programs to improve social services. The government agreed to privatize, rationalize or liquidate most of the 150 parastatals, many of which were losing money and could not operate without government subsidies.

The government is struggling to maintain itself and the country. Today, the economy is in a state of flux. The civil service is working, but paychecks are often delayed. Operating expenses have been reduced to a subsistence level and public services have been cut. Government payments to private suppliers and to farmers have been delayed. Banks have a liquidity problem. Civil service employment surpluses and government generosity in terms of salaries have created employment and wage distortions within the economy. The economic problems have created a growing dissatisfaction with the current government. Consequently, the government is struggling to maintain the confidence of the electorate.

3.2 PROGRESS IN MEETING COMMITMENTS

Some progress has been made. Progress in achieving the structural reforms has been slow, but important steps have been taken. The government has suspended civil service recruitment. Wages have been frozen and many fringe benefits have been eliminated. The government has identified the first 15 parastatals to be privatized, including two wood and paper companies. The government has sold one parastatal, the national banana company, to a French firm. Parastatals that remain under government control are being reorganized to focus on efficiency and profit. Employee wages are being

cut, surplus employees are being laid off and performance contracts are being signed with senior management. Some progress has also been made in restructuring and revitalizing the economy. For example, the current account balance is improving. The deficit in 1989-90 was estimated to be only about 2 percent of GDP.

Recovery will be slow, and per-capita GDP is not expected to increase. However, despite current efforts to stabilize the economy, moderate government expenditures, and loosen the constraints that inhibit growth and recovery, macro-economic analysis shows that the recovery will be slow and gains will be modest. It will be at least 4 or 5 years before the structural modifications implemented by the government are reflected in the economy. The GDP is estimated to grow at about 2.3 percent between now and 1995, increasing to 3.4 percent between 1996 and 2000. Assuming that the population grows at 2.3 percent, per-capita GDP will remain about the same.

Possible devaluation of the national currency may help. It should be noted that the CFA could be devalued, and that this action would have a major effect on resolving the problems in the Cameroon economy. The CFA, currently tied to the French franc, is considered to be substantially overvalued. This makes exports less competitive on the world market and imports more attractive. A devaluation, rumored to be imminent, could positively shift the balance of payments and could provide extra revenue with which the government could resolve some of its debt problems.

3.3 CONSEQUENCES FOR THE NATURAL RESOURCE BASE AND ITS MANAGEMENT

The government is actively exploiting tropical forests for revenue. The crisis has had a strong direct impact on the management, use, and maintenance of the natural resource base in Cameroon. As oil, cocoa and coffee export revenues diminished, the government has turned its focus to other sources of revenue. One potential source is the abundant supply of tropical hardwoods, located primarily in southern Cameroon. In seeking export tax revenues, the government has promoted the exploitation--harvest and export--of this resource. Such promotion has reached the highest levels of government. In a letter to the director of the Department of Forestry, the President identified tropical hardwoods as a potential revenue source and encouraged a substantial increase in the harvest and export of tropical forest wood products. Exports initially decreased both in quantity and value between 1984 and 1988. Both the volume and the value of exports, however, increased dramatically in 1988/89. (See Table 3-3.)

Table 3-3 Quantity (metric tons) and Value (MM CFRfr) of Tropical Forest Roundwood and Lumber Exports, 84/85-88/89.

	84/85	85/86	86/87	87/88	88/89
Quality	551,257	388,328	300,601	357,100	529,339
Roundwood Lumber	61,569	40,949	25,877	43,799	91,716
Value	24,914	23,348	18,251	19,646	34,233
Roundwood Lumber	5,081	3,683	2,634	4,648	10,542

Source: Information on file at the World Bank.

Harvest of timber for domestic support has increased. The economic crisis may be causing indirect impacts as well. The government suspended agricultural price support payments to the farmers. Some farmers turned to cutting wood for fuel, a readily available free resource, that could be sold to generate the necessary revenue. The quantity of fuelwood offered in the local markets increased, but the price dropped. The farmers therefore increased fuelwood harvests, setting off additional price decreases. Thus, the increased harvest has increased pressure on the natural resource base, and could result in environmental degradation in the areas surrounding major markets.

3.4 IMPACT OF CRISIS ON MANAGEMENT OF NATURAL RESOURCE PARKS

Massive cuts in operating budgets have seriously hampered park management. Even protected areas are suffering from the economic and fiscal crises. Massive cuts in the budgets of departments charged with managing natural resources have rendered those departments virtually unable to manage or protect the resource. When the reductions are allocated, the salary purse remains intact; most of the cuts are taken from the operating budget.

Management budgets for the three parks managed from the Maroua District office (Waza, Mozogo-Gokro and Kalamaloué) have dropped 25 percent since the crisis. Many programs have been eliminated or postponed. Equipment purchases have been eliminated and equipment maintenance has been reduced.

Operating budgets for parks managed from the Bénoué District (Faro, Bénoué and Boubandjidah) have been reduced by 90 percent in 5 years, from CFA 200 million to CFA 20 million in 1991. Operating funds are so meager that the office had to petition for a separate expense allocation to pay for a grader to repair roads and open the Bénoué park for tourists.

Before 1986, the district was able to keep the fees collected at park entrances and use this revenue for operating expenses. Now, in response to the crisis, these funds are sent directly to the treasury. Earmarking some or all of the park entrance fees for the park's recurrent costs should be a policy reform USAID should carefully consider and promote through its program conditions.

The crisis has therefore had a marked effect on the management of Cameroon's parks. Priorities which emphasize revenue generation and budget cuts have reduced the ability of the Departments charged with the management of the parks to pursue conservative, non-exploitative, preservation-oriented management programs.

Option:

- USAID could carefully consider for promotion, as a policy reform through its program conditions, earmarking some or all of the park entrance fees for the park's recurrent costs.

4.0 POLICY AND INSTITUTIONAL FRAMEWORK

National policies reflect the need for political stability by emphasizing short-term revenues, not protection and renewal. Cameroon policy and institutional context for natural resources management has been shaped for three decades by factors with marginal relevance to environmental impact, exploitation, and protection. This approach ignores the potential for thoughtful investment in groups and regions where it will count.

Instead, the government invests to satisfy the largest number of competing groups. This policy springs from a twin preoccupation: ensuring the support of key elites (including the politicians themselves, officials, and key national and international business groups) and promoting national unity. Consequently, Cameroon's national resources base is being exploited as a major source of revenue for the State and key elites. A highly centralized government must satisfy the need for food security and adequate employment opportunities, both critical to internal stability.

As a result, policies emphasize generation of short-term revenue. The policies also lack internal coherence and consistency: They involve multiple agencies, ministries, councils, and so on, which operate without coordination or global perspective.

4.1 CURRENT AND PROPOSED POLICIES

4.1.1 Forest Policy[1]

Current policy focuses on exploitation. The current forest policy (legislated and embodied in "Law No. 81-13 of 27 November 1981" and "Decree No 83-169 of 12 April 1983") establishes regulations governing forest management in Cameroon. The documents contain brief, general mention of conservation, protection, and rational management. However, the only detail and operational language pertains to short-term exploitation. For example:

- Forest inventory (the underpinning of sound forest management) is described in terms of the exploitation process.

[1]For purposes of this discussion, it is assumed that forestry law should delimit certain boundaries surrounding the activities in which forest sector constituents engage. It should recognize and support the structures and function of that sector. Where laws are drafted independent of reference to the requirements of the industrial component of the forestry sector, they may impede or in fact reorder sectoral priorities.

- The legislation contains no provision covering the main causes of deforestation: forest clearing (and waste) for agricultural purposes in the South and fuelwood in the North.

- The legislation does provides extensive detail on a rapid short-term exploitation process.

- It does not address sound management techniques which would reduce short-term waste, provide for the long-term exploitation of the forests as a renewable resource, and/or ensure conservation and protection.

Current policy is not comprehensive, integrated, or well-thought-out. The 1981 legislation lacked both an overall harmonizing purpose, a comprehensive, integrated land-use planning system to drive the development of the legal framework required to support environmental and economic goals. Outside of this framework, there is the risk that the legislation will drive the objectives. Many of the 1981 laws tried to control most aspects of forestry development and practice. The legislation in fact produced several requirements with which the government and forest sector were unable to comply.

Draft forestry legislation and attendant policy reform for the country are currently underway. Any review of the proposed legislation would require that it be evaluated against the preferred objectives, implementation and results of the "missing" strategy and management plan.

Options:

- The responsible Ministry should have a policy and legislative Branch. Aspects of current ministerial responsibility for forest resources is invested among twelve different Ministries. The Cameroon situation would improve if a policy and legislative branch were instituted within the responsible Ministry. Where the Ministry shares other resource mandates, the responsibility of this branch should fall to the deputy responsible for the forest sector to maintain a measure of independence from non-forest sector resources and to ensure that an identifiable individual is in charge and accountable.

- A Chief Forester position should be created. In other forestry jurisdictions, overall legislative responsibility does usually lie with a single Minister; but the officer accountable for the majority of legislation adjudication, amendments and implementation is a Chief Forester. The title imparts a clear responsibility for forest resources management. Traditionally, the Chief Forester has considerable power to direct forest management planning and implementation and a clearly defined independence from more senior and political officers. Cameroon would benefit from creating such a post.

- Legislation should be developed with all due speed. The forestry legislation reform is premature in some respects (preceding a resource management plan) and overdue in others (because of its delay in recognizing and supporting non-timber exploitation objectives). Even where enabling legislation may be revisited seldom, related regulations may continue to change.

- Coordination should be established between those writing and those implementing policy. The mechanisms to prepare and affect regulations should include a close liaison between those drafting regulations and those promoting and eventually implementing them. Such a mechanism does not currently exist, partly because required communication between regional and central administration is lacking and partly because adequate personnel are lacking at all levels, from field officers, through to regional directorate staff and Ministry executives.

- The country needs a comprehensive Forest Policy Manual. The manual should comprehensively address all policy, regulatory and legislative codes, and practices. For each level, it should outline required documentation (plans, licenses, annual reports, audits, etc.), distribution of responsibility among officers, sanctions, renewal or amending procedures and associated policy, regulatory and legislative codes, and practices. Once developed, it is perhaps the most critical and useful component of a country's resource planning and management support. USAID/ Cameroon could support the development of a Forest Policy Manual.

4.1.2 Protected Areas

The present system of protected areas in Cameroon officially includes 7 parks and 9 wildlife reserves[2] (MacKinnon and MacKinnon 1986; Gartlan 1989; Stuart et al. 1991; Table 2-2). Six parks are in the savanna zone; one is in the humid evergreen forest (Guinean or Biafran subtype). Two areas (Dja and Mbam et Djeram) are under official consideration for national park status (Gartlan 1989). Three areas (Lake Lobeke, Nki, and Boumba Bek) are under consideration for wildlife reserve status. They are the areas of the proposed Cameroon component of a Tri-National Park (World Wide Fund for Nature Cameroon and WCI 1991). (Additional details on park composition and protection can be found in **Chapter, 2.0.**)

Despite numerous categories of forest, legally protected areas are limited. The current legal basis for protected area and forest management is set forth in Law 81-13 and Decrees 83-169, 83-170, and 83-171 (Cameroon [no date]; Schmithusen 1986; Ze Meka

---

[2]Technically, there are nine wildlife reserves; however, two have been destroyed, one has been degraded by 50 percent, one is currently open to timber concessions, and one is in process of being declassified.

1988; Gartlan 1989). Forests include almost all non-residential lands. They are divided into the following categories:

State forests:

- national parks (parc nationaux),
- wildlife reserves (réserves de la faune),
- zoological and botanical gardens,
- strict nature reserves,
- nature sanctuaries,
- protection forests (forêts de protection),
- production forests (forêts de production),
- recreation forests,
- forest plantations, and
- state game ranches.

Local Council forests

Private forests

Communale forests (domaine nationale)[3]

Timber is derived almost entirely from communal forests. Production forests will constitute a significant additional set of areas for exploitation. The remaining forest categories occupy small total areas.

The law also defines hunting and buffer zones, which are supposed to surround each national park (Gartlan 1989). Hunting zones have been designated around some savanna parks. No buffer zones have been established, in part because the protection in these zones is the same as in the parks themselves and would exclude human habitation.

The designation of national territory as "state forest" does not necessarily mean official protection. Law 81-30 states that 20% of the national territory shall be designated as state forest. However, state forests include production forests, intended mainly for timber production and may be replanted with exotic species. For example, land-use proposals (propositions d'affectation des terres) for the south and southeast allocate total land surface seen in Table 4-1, below.

---

[3]Current land-use proposals (e.g., Cabana 1988c; Tremblay and Ngong 1989) divide communal forests into exploitation forests (forêts destinées à l'exploitation) and lands for agroforestry.

Table 4-1 Sample Land-use Allocations

National parks and wildlife reserves	11%
Protection forests	2%
Production forests	22%
Exploitation forest	28%
Agroforestry	36%
Local council forests	1%

(Cabana 1988c; Tremblay and Ngong 1989).

Table 4-1 shows that 35% of the land allocated to state forests, but only 13% to protected areas.

Forest policy lacks important features. The definition of forest lands also presents difficulties because it applies to the situation in the South of Cameroon; it does not reflect management or exploitation requirements in the northern savannah and Sahel zones. The "domaine forestier" is broken down into three distinct sections (forest, parks and reserves, and fisheries). The legislation does not provide for general public participation in the development or management of forest-centered activities. Finally, there is no provision for revenue generation from the process of forest exploitation for domestic energy (fuelwood) which provides 90% of the energy resource utilized in Cameroon.

The system of legally protected areas consists in effect only of the national parks and wildlife reserves. Once the areas previously designated as forest reserves have been reclassified into protection and production forests, protection forests will constitute a third, less-extensive and less-well- protected category of protected areas. There are no existing strict nature reserves or nature sanctuaries.

4.1.3 The Tropical Forest Action Plan

A multi-national initiative aimed at thoughtful management and public participation. International organizations and the Cameroon Government have undertaken new initiatives following international interest in tropical forests and biodiversity. Interested citizens have participated as well. The new initiative took shape as part of the **Tropical Forest Action Plan (TFAP).** The Plan called for high-level political support for the conservation, protection, and sustainable management of forests and the related natural resource base. The TFAP was prepared primarily by forest technicians focusing on forest exploitation under the sponsorship of the United Nations Food and Agriculture Organization (FAO) with the Government of the Republic of Cameroon.

The TFAP met with mixed reviews both locally and internationally. For the first time in Cameroon, however, it presented detailed recommendations for rational management over the long term. It also established issues of popular participation in forest management and conservation of the natural resource base (e.g., soils, watersheds, wildlife) and protection of critical zones of biodiversity.

The Structural Adjustment Program (SAP) seeks to reinforce its goals in the TFAP. The TFAP has been reinforced and refined by natural-resource-related sections of the World Bank's SAP. SAP reforms related to the forestry sector focus on three areas: improved legislation, revenue collection destined for the national treasury and/or rural communities, and institutional reform (streamlining of Government agencies and privatization of parastatals). Outcomes are intended to address the major weaknesses of prior legislation. Important elements of the forest sector targeted in SAP documentation include:

- Land use planning in forest zones;
- Interaction between agriculture and forest;
- Protection of Biodiversity (parks and reserves);
- Forest Resource Management in dense forest areas;
- Management of natural resources and fuelwood in the north;
- Forestry research;
- Institutional strengthening;
- Societal concerns (primarily Pygmies in the southern forests); and
- Environmental impact assessment of SAP projects.

4.1.4 Proposed National Legislation

Draft legislation aims to respond to the TFAP and SAP. A concrete result of the TFAP and SAP initiatives is the most recent draft legislation prepared by the Ministry of Agriculture and circulated for review in July 1991. The preamble of the draft mentions conservation, the need for rational management of the natural resource base for the long term interests of future generations, protection of the flora and fauna, and a single Government source for efficient management and control. It also calls for the participation of local communities and individuals in the management of natural resources.

Draft legislation has significant deficiencies. However, a variety of potential problems surface in the details. For example, the draft legislation does not deal with the relationships among the forest, the arable soils which the forest produce and retain, and the subsistence needs of peasant farmers. The articles pertaining to forest exploitation are presented in six pages of considerable detail. The one-page discussion on protection was added as an afterthought and seems brief and vague.

Options:

- The draft legislation could be professionally evaluated, with particular reference to the overbalance toward exploitation. Technical assistance should fully examine the full range of issues, including revenue generation, rational management participation, and conservation in the final legislation. A series of regulating decrees which follow the passage of new legislation will also be crucial in making the law operational. The uneven balance between exploitation and conservation is a strong concern, given the content and tone of the Presidential directive of March 1990 which exhorts the Ministry of Agriculture to increase forest exploitation in response to GRC revenue requirements.

- Private sector involvement should be fostered in legislation. Legislation should encourage and provide for private sector involvement in the development of a forest industry sector in Cameroon, so that entrepreneurs can plan according to their interests, as well as those interests imposed upon them by the state. Such encouragement of vigorous entrepreneurial activity can then be channeled toward the enhancement of society's goals.

- Legislation should provide for both conservation and economic development. A balance must be struck between divergent interests. Clearly, sustainable development and environmental conservation should dominate overall objectives. The scope and structure of potential private sector involvement must first be established; then, transition or evolutionary incentives should come into play to encourage its engagement. Legislation should reflect a pragmatism that, though based in broader multifaceted social goals, does provide the flexibility to stimulate private sector development.

The timber resources in Cameroon, though renewable, do have a finite sustainable annual harvest volume. Development strategy and resource management will define that volume. In turn, volume will dictate the structure of the industry and, finally, the enabling legislation required to support industrial development.

4.2 OTHER NATIONAL POLICIES INFLUENCING THE FORESTRY SECTOR

Forest sector policies do not exist in isolation. Population, industry, agriculture, energy, and land tenure and state lands policies interact with the Forest sphere.

As with forestry, exploitation and revenue generation take the forefront. Long-term concerns, management, and investment are uniformly inadequate. Policy integration, interministerial collaboration, and participation of popular forces in society get short shift in both current and proposed policy initiatives.

4.2.1 Population

Increasing population directly affects the land through agricultural expansion. Cameroon has a population of approximately 9.9 million (1985), growing at a rate of approximately 3.1 percent per year (1973-1984). At this rate, the population will reach 15.6 million by 2000.

An increasing population increases the pressure on the land for agriculture production. Permanent farm land is not increasing greatly: it is being cleared at a rate of approximately 8,000 hectares per year. However, between 75,000 and 95,000 hectares are cleared each year in slash-and-burn or shifting agriculture activities. So long as the fallow period is long enough to allow the forest to recover, these activities are compatible. Unfortunately, with increasing population pressures, the fallow periods have been shortened, depleting soils, increasing erosion, and degrading the environment.

A national population policy, currently lacking, is to be developed. There is today no clearly prescribed population policy in Cameroon, despite major Presidential speeches and the strong push from both national and international sources for improved family planning measures to address the 3 percent population growth rate estimated for the 1987-1990 period. A national policy on population is in development, through the United Nations Fund for Population. The principal ministries involved are the Plan and Regional Development (MINPAT) and the Ministry of Women's and Social Affairs. The policy process aims to balance population, resources, and development issues.

4.2.2 Energy

The government has been developing a new energy policy since 1988. The initial effort did not address domestic energy, 80 to 90% percent of which is wood or charcoal. Consequently, the World Bank funded a domestic energy study to ensure the proper place of this issue in overall energy policy. Since the energy policy is a function of the Ministry of Mines, Energy, and Water, while forest policy is in the hands of Agriculture, coordination becomes an issue.

4.2.3 Agriculture

The agriculture policy (proposed June 1990) appears to be more a result of the SAP than an indigenous effort to improve management of agricultural resource. Issues of exploitation and increased revenue receive in-depth treatment, while soil conservation, fertility, and watersheds (issues which lie at the foundation of national management of agricultural resources) are treated with brief courtesy but inadequate detail. Furthermore, the linkage between forestry and agriculture, both of which lie within the same Ministry, receives little attention in policy documents.

4.2.4 Land tenure

The current policy dates from 1974. The land tenure laws assign all land to the government, although government recognizes traditional land rights and privately developed lands. The line between government lands, traditional lands and privately developed lands is fuzzy, particularly when the government takes over traditional lands. This major source of conflict requires much rethinking and development of laws that takes all interest groups into consideration.

Ownership based on bringing land to productivity increases agricultural extension and destruction of natural resources. The basis of the current policy provides for ownership rights to lands which have been transformed from their natural state to "productive" areas. Most of the land goes to the people who cut down most of the forest. However, the peasant farmer does not normally have the means to influence the bureaucratic system and obtain formal title.

Since the state-run agricultural and investment systems do not provide traditional farmers with the technology or funds to move from an extensive to an intensive process, and since their access to land titles is often insecure, the traditional agricultural population is in constant quest for new lands. Natural areas disappear rapidly, as the fertility of lands farmed traditionally diminishes after a few years of use. This policy in Cameroon encourages destruction of the forest and areas of the Sahel and Savannah as well, in a process which is neither planned nor managed. Extensive land management practices are encouraged when land is easily available and their monetary value is low. The US experienced a similar situation which lead to the infamous "dust bowl."

Population pressure and traditional extensive agricultural practices promote a constant and increasing search for new lands. Land ownership is largely traditional, with 84% held by "permanent" attribution and 8% held under "temporary" attribution. Only 2.4% of the owned land is held by land title and 6.5% is used under some kind of rental arrangement (MINAGRI, 1988). Land rental is relatively low compared to other West African countries, and indicates that land access and ownership is more easily acquired. Tenure is always a problem and property rights are weak in Cameroon. Without tenure, farmers take a short-term view. They are unlikely to plant trees or conserve if the rewards are not theirs. This is particularly true in labor-intensive investments such as terracing or gully plugging. Land tenure problems between farmers and herders in the north are often made worse by intervening government officials. If land tenure laws are to be revised, then a thoughtful use of traditional laws should be considered.

Studies are beginning, but policy reform is not imminent. Donor-financed initiatives to study land tenure practices (e.g., World Bank and GTZ) are in the early stages and should establish the functional link between forests, agriculture, soil fertility, and so on. No new policy initiatives appear to be forthcoming in the short term. Furthermore, the proposed studies apply to the forest areas of the South of Cameroon and ignore the

Savannah/ Sahel zones in the North. Even if a comprehensive review of land tenure practices could be finished in the next 2 or 3 years, the issue of policy integration and coordination remains. The Ministry of Town Planning and Housing (MINUH) is responsible for this policy area. If forestry and agricultural policy are not integrated within the same ministry, a major effort would obviously be needed to obtain collaboration between MINUH and other natural-resource-related policy initiatives.

Improvements in governmental policies and laws would contribute the most to sustainable natural resource management of all of the possible NRM interventions. These laws are fundamental to how land is managed and used.

4.2.5 Tree Tenure

Tree harvesting policy reserves resource ownership authority to the government, a disincentive to farmers. Cameroon law that states that individuals cannot harvest trees without a permit, even on their own land. The forestry law of 1981 stated that "naturally growing trees are owned by the government while trees planted by man belong to whoever planted them." Management of tree plantations fall under the responsibility of Direction de Forêts, which issues cutting permits to exploit the trees. The result is that many of the plantations go unmanaged and unexploited.

Villagers cannot understand why government owns trees found on their land whether naturally grown or planted by man. Farmers feels that if they plant a crop on their own lands, cultivate it, and bring it to maturity, they should be able to harvest it without the permission of the government. Many farmers feel that to plant trees is to transfer authority (and therefore some stake in ownership) to the government. The law therefore tends to inhibit participation in tree cultivation programs by local farmers. Some farmers plant exotic species on their land, simply because it is easier to convince the Forestry Department representative that they actually planted the trees if they are not native to the area.

4.2.6 Industry

The industrial policy of Cameroon is found in the "Plan Directeur de l'Industrialisation du Cameroon" (September 1989). The food and agriculture industries and industries involved in wood transformation form the basis of future industrialization in Cameroon. Since none of these industries are proposed on the basis of national resource management, this development will inescapably involve the unnecessary destruction of lands. No additional policy initiatives in this area are proposed.

4.2.7 Taxes and Tariffs

Some of the taxes appear to be inequitable. The primary tax imposed upon the farmer of Cameroon is a head tax, estimated to be about 10 percent of the annual cash income of the average farmer. The tax is collected each year by an appointed official

(usually the village chief), who then issues the tax payer a tax stamp. Without a tax stamp, an individual is not able to travel into the village, to the market or through the many checkpoints on most routes in the country. A head tax is not an equitable tax: rich and poor pay the same. The wealthy consider it a nuisance, while to the poor, it may be a real burden.

Taxes are also imposed upon each head of cattle owned by an individual. A cattle tax appears to be more equitable because only better-off farmers own cattle.

In order to generate revenue, the government has imposed a 2-percent tax on the export of unprocessed products. (Manufactured goods are exempt from the tax.) Some exports are additionally assessed special taxes: coffee (40 percent), cocoa (50 percent), and forest products (15 to 40 percent).

4.3 IMPROVING POLICY DEVELOPMENT

The following conditions will need to be met to achieve real, long-term, and well-integrated policy solutions:

- Increasing understanding and awareness of the importance of well-developed policies in the conduct of national life.
- Encouraging productive experience in policy development and management.
- Drawing citizens into the process.
- Addressing the double task of critical priorities in the short term and resolution of policy weakness in the long term.

A National Environmental Action Plan presents significant opportunities for policy reform and development. The international community and new constituencies in Cameroon society have the opportunity to muster experience and tools to attain improved governance and policy formulation and to balance short- and long-term outcomes in the natural resource sector. One effective and widely used instrument of process is the **National Environmental Action Plan (NEAP).**

The NEAP process is coordinated by the World Bank and the host country. Its goal is to establish an integrated set of structural changes, improved policies, administrative changes, and development activities, to try to achieve a rational balance between societal needs and conservation of the nation's natural resources. A wide range of public and private national and international organizations join to prepare a broad framework of the needs in the natural resource sector and strive for agreement on coordinated financing and

program actions to resolve the range of identified problems over the short and long term, with an emphasis on the latter.

The NEAP is not perfect. It is often a function of the personalities of the representatives of individual countries: their determination to succeed in the face of frustration and their willingness to compromise and forego parochial interest to achieve a rational approach to a complex set of related problems. The duration of the two-to-four-year process appears long, but the investment of time and related resources is a small price to pay to resolve the chaotic, conflict-ridden policy and program situation which, as in the case of Cameroon, often undermines the natural resource sector.

Option:

- **USAID should consider supporting the development of a NEAP.**

4.4 INSTITUTIONAL CULTURE

Institutions are hierarchic, multi-layered, competitive, and compartmentalized. The institutional framework in Cameroon is the product of a political structure which is centralist, hierarchic, and geared to the collection and distribution of rents. The institutions characteristically include many competing offices and agencies. Most structures and functions involved in revenue collection and control and management processes which are hierarchical and risk-aversive.

The structures and functions of two key natural resource organizations serve to highlight local institutional trends. The Department of Forests and the Department of Parks and Protected Areas fall into two distinct and highly competitive Ministries when, in fact, they should be closely related if not fully integrated in an efficient management system.

Department of Forests

The Department of Forests, located in the Ministry of Agriculture, is divided into five sections:

Inventory Section,
Forest Exploitation,
Forest Studies and Statistics,
Industry and Wood Production, and
Control of Forest Exploitation and Industry.

A review of "Decree No. 89/140 of 27 January, 1989" reveals that four of the five sections are concerned solely with revenue collection and control. Only one

section--Forestry Management and Regeneration--does actually conduct management or regeneration operations. Although the section's main responsibility is forest inventories, the work was actually given to other competing organizations, ONAREF and CENADEFOR, which were autonomous and operated with donor funding. CENADEFOR and ONAREF have been unable, in 10 years, to produce a viable forest inventory, aside from those produced at great expense by Canadian technicians.

In 1990 ONAREF and CENADEFOR were fused into one new organization, the Office National du Development des Forêts (ONADEF), which duplicates many of the functions of the Forest Department and especially the Management and Regeneration section. Despite this duplication of functions, ONAREF itself had more than 2000 employees but only 100 technical positions.

The other four sections of the Forest Department are strictly revenue and control operations. For example, Section for Control of Forest Exploitation and Industry, the largest and best-financed unit in the Forest Department, is responsible for supervision of work sites; compliance with forestry regulation; and contract compliance; and collection of forest taxes. Field sources say the only active role of this section in the provinces involves the collection of taxes or other "informal" but institutionalized fees.

Department of Parks and Protected Areas

The structure and function of this department in the Ministry of Planning ("Decree No. 89/1756 of 29 November 1989") state that the activities of the Department are consistent with appropriate management interventions. The Department consists of three sections: Protected Areas, Hunting, and Tourist Sites. As with the other two sections, the specific mandate and organization of the Protected Areas section appears sound.

The activities of the Section are:

- The creation and management of national parks, wildlife reserves, zoological gardens, sanctuaries etc.;
- Wildlife and conservation education and awareness; and
- Relations with national and international conservation organizations.

Despite having a clear operational mandate, the Section has not created new parks or reserves, carried out an inventory, drafted a management plan, or conducted an education campaign. This lack of activity has existed since before the recent financial crisis. The only park created since independence is Korup (1983/84), due to the investment and pressure from the WWF. The Section has actively collected fees for hunting park entry and use of the "Campements." However, since the Department has made no adequate

investment in infrastructure or equipment in recent years, the authorities are unable to fulfill park control and wildlife protection responsibilities effectively.

The Departments of Forests and of Parks and Protected Areas are also a major conduit in the redistribution of government revenues among the bureaucratic elite. The budgets of both Departments have been cut significantly in recent years. The main line items, payrolls, show the most resilience and consume 80% to 90% of the budget.

Jurisdictions overlap and fragment in a series of widening responsibilities. At least 11 other ministries, and numerous offices within each, have a role in the natural resource field. (See Table 4-2 for a listing of the governmental organizations immediately concerned with conservation in Cameroon.) Despite (or perhaps because of) the array of organizations and the thousands of employees within them, rational policies and management programs have not been forthcoming.

Organizations which implement legislation have multiplied. The organizations include several agencies of the Ministry of Agriculture (ONADEF, Direction des Études des Projets, Direction des Forêts), the Ministry of Tourism (Direction de la Faune et des Aires Protegées, etc.) and the Ministry of Fisheries, Livestock Production and Animal Husbandry, the Ministry of Industrial and Commercial Development, the Ministry of the Plan and Regional Development, the Ministry of Territorial Administration among others.

The governmental agencies most immediately concerned with biodiversity or tropical forests are:

- The Directorate of Wildlife and Protected Areas, which has responsibility for national parks and wildlife reserves;
- The Directorate of Forests, which has responsibility for other state-owned forest lands, including the former forest reserves (réserves forestières);
- The Ministry of Agriculture, the National Office in charge of Forest Development (ONADEF, formerly ONAREF and CENADEFOR; Cameroon/ONADEF 1990, 1991);
- The Ministry of Higher Education, Scientific Research and Computer Studies (MESIRES, Ministère de l'Enseignement Supérieure, de l'Informatique et de la Recherche Scientifique);
- The Institute for Agricultural Research (IRA) and the Institute for Zootechnical Research (IRZ);
- The Center for Forestry Research (CRF, Centre de la Recherche Forestière), a unit within IRA;

- Educational institutions with relevant programs: the National University (Université Nationale) of Yaoundé, the National Herbarium (Herbier National) in Yaoundé, the University Centre (Centre Universitaire) of Dschang and its satellite campus (antenne) at Maroua, the Wildlife College (École de Faune) at Garoua, and the National School of Waters and Forests (École Nationale des Eaux et Forêts) at Mbalmayo.

Still more organizations share responsibilities (and salary revenue) for similar mandates. The multiplicity of organizations in other Ministries with the same mandate as those of Forests and Parks is another avenue to redistribute revenues among the elite. An illustrative list of such arrangement includes:

- Direction of Planning Ministry of Planning and Regional Development (MINPLAN) with a Forest Planning Service. No products of this service can be found.

- Direction de l'Aménagement au Territoire et du l'Environnement (MINPAT), charged with producing measures for new forest resource management. Measures have not been produced.

- Division de Project, Ministry of Agriculture, charged with the identification and preparation of investment projects in the forest section. No investment studies have been carried through this office.

- Institute of Agronomic Research in the Ministry of Higher Education Computer and Scientific Research, charged with research in forest exploitation and silviculture. Research is very limited and without application. The same situation applies to IRZ and Wildlife.

Organizations do not coordinate efforts. Other examples of this type of inefficiency are found throughout the bureaucracy. Multiple staffing would at least be of marginal use if it provided coordination between the various Directions, Bureaux, and Ministries, but it does not. Each of the various Departments not only fails to coordinate with outside groups but does not coordinate actions within its own web of units.

Individual staff mirror organizational preoccupations. The organizational focus of revenue collection and distribution reaches down to individual behaviors and attitudes. The observed interest of individual bureaucrats is also revenue collection, either for themselves (informally, as bribes) or for their organizations (formally). Respect for the hierarchy and "cooperation" with others in their organization is also enforced through the reward patterns of daily interpersonal action and through the official civil service evaluation process.

The evaluation criteria focus on three issues: respect for the hierarchy, office discipline, and technical capacity. The first two issues reflect and reinforce the compulsive

governmental behavior. The third, technical capacity, is primarily a function of the employee's ability to collect revenues and implement the narrow focus of government policy. Technical capacity in its broader sense does not appear to be a factor in the process. In fact, since organization budgets do not cover operational costs, true technical expertise is impossible to evaluate on a uniform basis throughout the bureaucracy. During the assessment team's visit to the capital and the field, staff comments revolved around budgets, equipment and control. No one mentioned traditional management concerns such as planning, development, investment, efficiency or public service. When questioned, only one of many respondents was aware of inventory and management planning elements in his organization's mandate.

The consequences and outlook for the natural resource base are serious. The consequence of the current institutional context is destructive to the nation's long-term interests and its natural resource base. The emphasis on revenue, hierarchy and control without an appreciation for policy formulation and management techniques has produced a bureaucracy increasingly unable to attain its short-term goals (collect revenues to ensure its survival), much less enable national development.

The limited revenues available are invested in immediate personal and political interests (military equipment and government salaries). As a result, the national infrastructure is in an advanced state of decay. The national heritage of natural resources is being lost at an alarming rate.

With the current liberalization initiative and the consequent changes in government policy formulation and institutional framework, a process which is open and transparent could be begun. The acquired behavior of current bureaucrats will require a longer time to modify than that needed to adopt better policies. The slow rate of behavioral change will produce tension and conflict which will make the liberalization process difficult. In view of the existing traditions, government action must ensure compliance by its bureaucracy with needed changes. Organizations cannot be asked to review "Options" which will be painful for their agencies and colleagues.

5.0 SUSTAINABLE AGRICULTURE

5.1 INTRODUCTION

Agricultural expansion is the greatest threat to Cameroonian forests and a major cause of wildlife habitat degradation. A million hectares of forest have been lost to agriculture over the past decade. This meant a loss to the national economy of between one-half and one million cubic meters of commercial logs (World Bank, 1988). Of the approximately 16 million hectares of productive forest that remain in the country, 150,000 hectares are lost each year (Tropenbos, 1991). Plantation agriculture accounts for only 8,000 hectares per year of this loss; shifting cultivation accounts for 75 to 95 thousand hectares annually (Gartlan, 1988).

Historic practices have worked against goals of sustainable agriculture. Sustainable intensification of agricultural and forestry practices is a logical goal to help reduce this resource degradation and alleviate poverty. However, historic practices and the current status of the economic work against these goals.

Historically, the government of Cameroon has placed all of its agricultural investments into industrial agriculture plantations for rubber, palm oil and sugar and for the commodity crops such as coffee and cocoa, which are grown by individual farmers. Food crops, predominantly grown by women, have essentially been ignored. The economic crisis, spurred by the probably long-term fall of oil, coffee, and cocoa prices, has led the government to talk about sustainable agricultural issues. However, Cameroon has minimal revenues to re-invest into agriculture, particularly sustainable food-crop agriculture. The country is still trapped into extensive agriculture and forestry exploitation in an effort to pay salaries, debts, and arrears.

5.2. EXISTING ENVIRONMENT AND PRACTICES

Diversity is the most striking characteristic of Cameroon's natural and human resources. This diversity provides Cameroon with economic opportunities unlike most other African countries, but also presents the country with complex management problems.

5.2.1 Agroecological Description of the Regions

The country's seven major ecological zones are climatically determined. These ecological zones are:

(1) evergreen rain forest;
(2) deciduous moist forest;
(3) semi-deciduous moist forest,

(4) mangrove forest,
(5) Guineaian savanna,
(6) Sudanian savanna, and
(7) Sahelian savanna.

Rainfall ranges from 630 mm/yr at Kousseri on the Lake Chad Plain to 10,000 mm/yr at Debundscha on Mount Cameroon. Most of the country receives between 1500-2000 mm/yr. Cameroon's wide range in precipitation and relief (up to 4,095 meters at the peak of Mt. Cameroon) supports a diversity of plant species, wildlife, and agricultural systems.

5.2.2 Farming Systems and Practices

Crop dominance is determined by ecological zone. Ninety-three percent of Cameroon's agricultural output is produced by small holders. It consists of food-crops, cocoa, coffee, and cotton. The remaining 7 percent consists of rubber, palm oil, sugar, tobacco, bananas from industrial plantations, which are mostly government-owned (World Bank, 1989).

The major staple crops generally fall into three regions:

- the forest zone, where cassava provides around 44 percent and plantain about 36 percent of the people's caloric intake;
- the western highlands, where maize provides 26 percent of the caloric intake, and white potatoes, sweet potatoes and cocoyams most of the rest; and
- the Sudano-Sahelian zone, where sorghum and millet provide 44 percent of the caloric needs, with cowpeas, peanut, and pigeon peas providing most of the rest (Ayuk-Takem, 1991).

The major cash crops of the small holders in these zones are robusta coffee and cocoa (forest zone), arabica coffee (western highlands), and cotton, peanuts, and irrigated rice (Sudano-Sahelian zone). Palm oil, rubber and sugar are grown in large-scale, mono-crop, plantations in the forest zone and do not compete directly with food crops for land, labor, and capital.

About 60 percent of Cameroon's energy needs are supplied by wood, the preferred fuel for cooking throughout the country. Only in the northernmost part of the country are wood supplies threatened. Natural resource laws and their enforcement in this part of the country discourage sustainable exploitation and management of trees on communal land.

Trees in the farming system appear to be used in the following ranked order, major to minor reasons:

- Fruit and cash crop production;
- property boundary marking;
- live fencing;
- wind and water erosion control;
- soil fertility improvement;
- wood and fodder production.

Major agricultural problems vary according to ecological zone. Maintaining good soil fertility is the major problem in the western highlands; crop pest and weeds are the major problems of the forested areas (Baker, 1991). Farmers in the northern savanna are most concerned by drought. Increased pressure from agricultural development in the highly populated areas is causing soil erosion and degradation, especially in the Western, Northwest, and Far North Provinces. Farmers are expanding out of the valleys in the Western and Northwest Provinces and planting their food crop on the steep, highly erodible slopes. They scrape the dark fertile top-soil into mounds for planting their roots and tubers, providing some erosion control. In the more populated areas of the north, excessive or poorly managed fuelwood exploitation and livestock grazing is leaving the soil surface exposed to erosion by wind and water.

5.2.3 Population and the Land Resource

An unevenly distributed population unevenly affects the land resources. Cameroon's population of 12 million is growing at a rate of 3.1 percent annually. Population is very unevenly distributed, with densities greater than 200 persons per square kilometer in the rural areas of the northwest, west, and far northern provinces. This uneven population distribution leaves large areas of the country unexploited in terms of agriculture, much of it in forested and protected areas. An FAO study estimated that Cameroon could support a population of 70 million, if arable soils were wisely managed (World Resources Institute, 1988).

Fifty-six percent of Cameroon's population is rural, and living primarily on the 1.1 million small farms. These farms average 1.8 hectares (cultivated) in size, and account for about 90 percent of total agricultural output and 80 percent of marketed output (World Bank, 1990).

Cultivated area (and therefore farm size) is closely correlated with the size of families. This is especially true for farms that produce mostly food crops. The largest farms (average of 2.7 hectares) are in the Southwest Province.[1] The larger holdings are

[1]The MINAGRI census does not take into account areas that are in fallow.

attributed to coffee and cocoa export crops. Most farmers in Cameroon plant between one and 1.5 hectares in food crops; the largest average areas occurring in the three northern provinces. The 1984 census shows that the average farm worker cultivates 0.45 hectares (MINAGRI, 1988).

About 76 percent of the total cultivated area was on farms above 1.5 hectares; the average farm size is around 1.8 hectares. This skewed distribution of cultivated area relative to mean farm size indicates that development programs with goals to improve farmers' standards of living and increase production may be confronted with equity problems (MINAGRI, 1988).

Table 5.1 Land Utilization in Cameroon (1984)[a]

	Million ha	% Total	% Arable
Total	47.5	100	
Physical	46.6	97	
Arable	34.1	72	
Cultivated	2.0[b]	4.3	0.6
Food crops	1.1		3.3
Cash crops	0.92		2.7
Forest	20.0	42	
Range/pasture	17.5	37	

a. World Resources Institute, 1988.

b. The 1984 census (MINAGRI, 1988) does not indicate that the figure of 2 million hectares includes those farm holdings that are in fallow. Therefore the total 1984 farmland would be closer to 7 million hectares if one assumes only 30 of total farmland is cultivated.

Cameroon's diversity also extends to soils. In fact, the variability of soil characteristics, especially those related to fertility, is a major problem for agronomists and agroforesters in developing widely applicable cultural techniques to improve production.

The more densely vegetated soils of southern Cameroon are predominantly sols ferralitiques of granitic origin (French classification system). These highly weathered, leached soils generally have a red subsurface. The surface can be black and rich in organic matter. They are classified as Oxisols and Ultisols under the USDA classification system.

The less densely vegetated soils of northern Cameroon can be described more completely. They include:

- soil shallow to rock,
- lithosols and sols minéraux bruts;
- moderately weathered and leached soils, sols ferrugineux tropicaux or Ultisols and Alfisols;
- poorly drained soils, sols hydromorphes;
- and salty soils, sols halomorphes.

Some of the major soil surveys of Cameroon are listed in Appendix B.

Soil fertility loss is a major preoccupation for farmers. Major constraints are low nitrogen and phosphorus, and soil acidity. Soil fertility problems associated with acidification through erosion and fertilizer application is a major problem in the western highlands of the West and Northwest Provinces.

Farmers assess soil fertility by observing the vegetation of the area. For forests and long duration fallows, trees such as Erythrophoeum guineense and Ficus vogeliana indicate good soil fertility. In cases of shorter duration fallows, grasses and forbs indicate the soil potential uses (Weber, 1977; and Ay et al., 1986).

Soil fertility is addressed by crop rotation and use of fertilizers. Farmers manage the fertility of the soil by rotating crops that demand higher fertility (such as beans, okra and cocoyams) with crops needing less, (such as groundnuts). Many fertility management systems exist throughout the country. For example, the rainfall runoff from family compounds located on ridgetops in the Mandara Mountains of northern Cameroon carries nutrient rich human and animal wastes down the slope, to be captured by the terraced fields before. Two tons of sorghum per hectare have been reported as a consequence. The relatively high yields in this drought-prone area are the result of an accidental but positive combination of nutrient recycling and water harvesting/conservation (Hijkoop, 1991a).

The MINAGRI 1984 census reports that 45 percent of Cameroon farmers used some kind of fertilizer, primarily for export crops such as cotton and coffee, and commercial maize (MINAGRI, 1988; MIDENO, 1990; and MINAGRI, 1991). Fertilizer on cash crops encourages its use on food crops.

Fertilizer use does not seem related to income or wealth. Small holders are just as likely to use fertilizers as farmers from larger farms. It is interesting to note that, as the cultivated area of a farm decreases, fertilizer used on a per-hectare basis increases, suggesting an intensification of management (Minot, 1991).

The MINAGRI (1991) fertilizer survey does indicate, however, that much better extension needed to reduce waste and mismanagement. Their survey reports that less than

15 percent of the farmers using fertilizer could correctly answer questions of practical importance in choosing and applying fertilizer (Minot, 1991).

The USAID and the EEC fertilizer reform programs do not seem to have greatly disrupted fertilizer use. The introduced efficiencies in transportation and distribution (as well as a drop in world market price) have reduced costs to the point that the loss of the government subsidy has not significantly reduced use. Proximity to a point of sale and the type of crops grown seem to be more important factors for farmers buying fertilizer (Minot, 1991).

Agricultural surveys have disregarded gender in terms of fertilizer use. For the MIDENO (1990) survey, only 19 of the interviewees were female, and the gender composition was not mentioned in the MINAGRI (1991) survey. Neither survey separated responses by gender, which could have suggested different knowledge of fertilizer use and could have been useful in directing extension programs. For example, Bantu women in Kenya have shown greater knowledge of soil fertility and crop production than their husbands (Tabor et al., 1990).

Because population is dense in the west and northwest provinces, coffee is cultivated on the better soils in the flat area, and roots and tubers (food crops) on steep, highly erodible slopes. This crop/soil management problem is one example where soil fertility and soil erosion issues are directly affected by crop profitability, markets, land allocation, and gender relationships, aspects that supersede technical interventions.

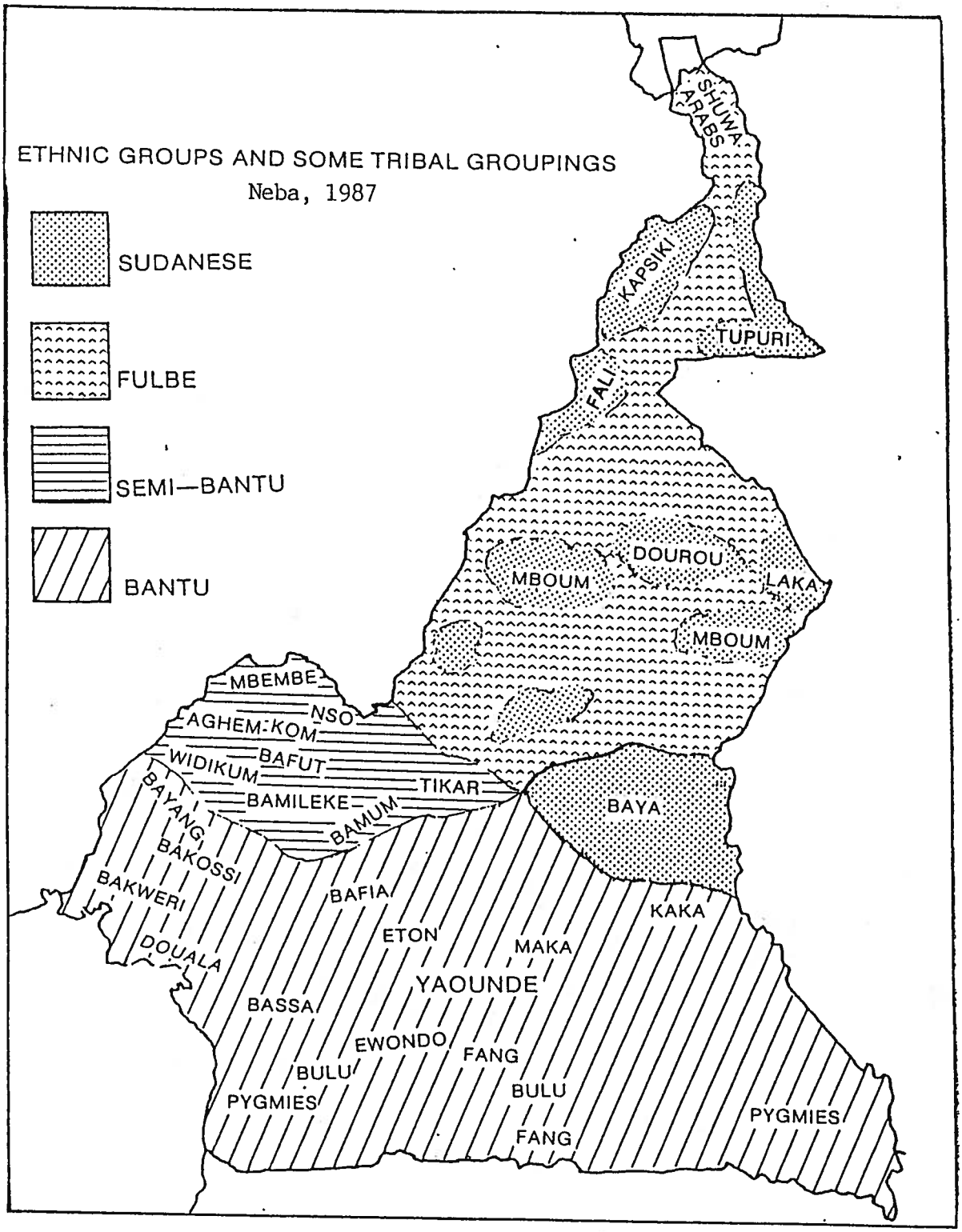
In dryer zones, where drought is more frequent, the increased risk of crop failure for rain-fed agriculture makes fertilizer use less attractive. A bias toward fertilizing indeterminate crops (e.g.,cotton) and away from determinate crops (maize) may be noticed because of their greater risk of total crop failure.

Farming systems used in the forested zones are discussed further in the following references: Weber, 1977; IRA, 1987; Almy, 1988; Almy and Besong, 1988a; Almy and Besong, 1988b; McHugh, 1988; and IRA, 1989. Systems that are used in the savanna zones are discussed in the following references: Fulton et al., 1978; CARE, 1990; Peltier and Eyog-Matig, 1988; Peltier and Eyog-Matig, 1989; and Hijkoop, 1991b.

5.2.4 Agricultural Labor Force

Gender, age, and ethnic background influence patterns of farming as well as acceptance of innovation. The Cameroon population is composed of about 240 different ethnic groups which are part of the Bantu, Semi-Bantu, Fulbe, and Sudanese groups (Figure 5.1). Very generally, **the Bantu and Semi-Bantu people** live predominantly in the forested southern half of the country and are mostly Christian or Animist. Women were once the exclusive growers of food crops. However, as the prices of traditional commodity crops has fallen, men have begun to grow the now more-profitable food crops. A few

FIGURE 5.1


ETHNIC GROUPS AND SOME TRIBAL GROUPINGS
Neba, 1987
SUDANESE
FULBE
SEMI—BANTU
BANTU
SHUWA ARABS
KAPSIKI
TUPURI
FALI
DOUROU
MBOUM
LAKA
MBOUM
MBEMBE
NSO
AGHEM-KOM
BAFUT
WIDIKUM
TIKAR
BAMILEKE
BAMUM
BAYANG
BAKOSSI
BAKWERI
DOUALA
BAFIA
ETON
MAKA
YAOUNDE
BASSA
EWONDO
FANG
BULU
PYGMIES
BULU
FANG
PYGMIES
BAYA
KAKA

women grow cash crops. The **Fulbe and Sudanese ethnic groups** live predominantly in the grasslands of the northern half of the country, and are mostly Moslem or Animist. The men of these groups are the principal farmers and herders. Women farmers generally grow only their traditional crops such as peanuts or dry season gardens. Women collect all fuelwood for these two groups.

Most of the ethnic groups in the southern half of Cameroon are relatively recent immigrants (19th and 20th Centuries). The most recent movement of people in Cameroon is shown in Figure 5.2.

Over 60 percent of all farmers making day-to-day decisions for the farm, have no **education** (83 percent of females and 58 percent of males). Only 9 percent of the farm operators had education past class 6 (3 percent for females and 10 percent for males).

Over the age of 15, there are slightly more **women** than men in the farm population; however, only 15 percent of the farm operators are female (MINAGRI, 1988). The World Bank (1989) found, however, that women produce 90 percent of Cameroon's food crops. In addition, women do not have the right to own land, under most of the traditional land tenure systems in Cameroon. As a result of these striking inequities, the Ministry of Women's Affairs wants more agricultural investment placed in the hands of women.

The 1984 census reports that the farming population is **aging**, as the youth are finding other vocations.[2] MINAGRI suggests that the older population, with little formal education, may be less willing to innovate, undertake long-term investments necessary to create tree crop plantations, and are less energetic. This could make the transfer of technology (extension) slow and expensive. MINAGRI also suggests that the national economy must begin to develop an environment which will provide increasing off-farm private sector opportunities, as well as on-farm incentives (MINAGRI, 1988).

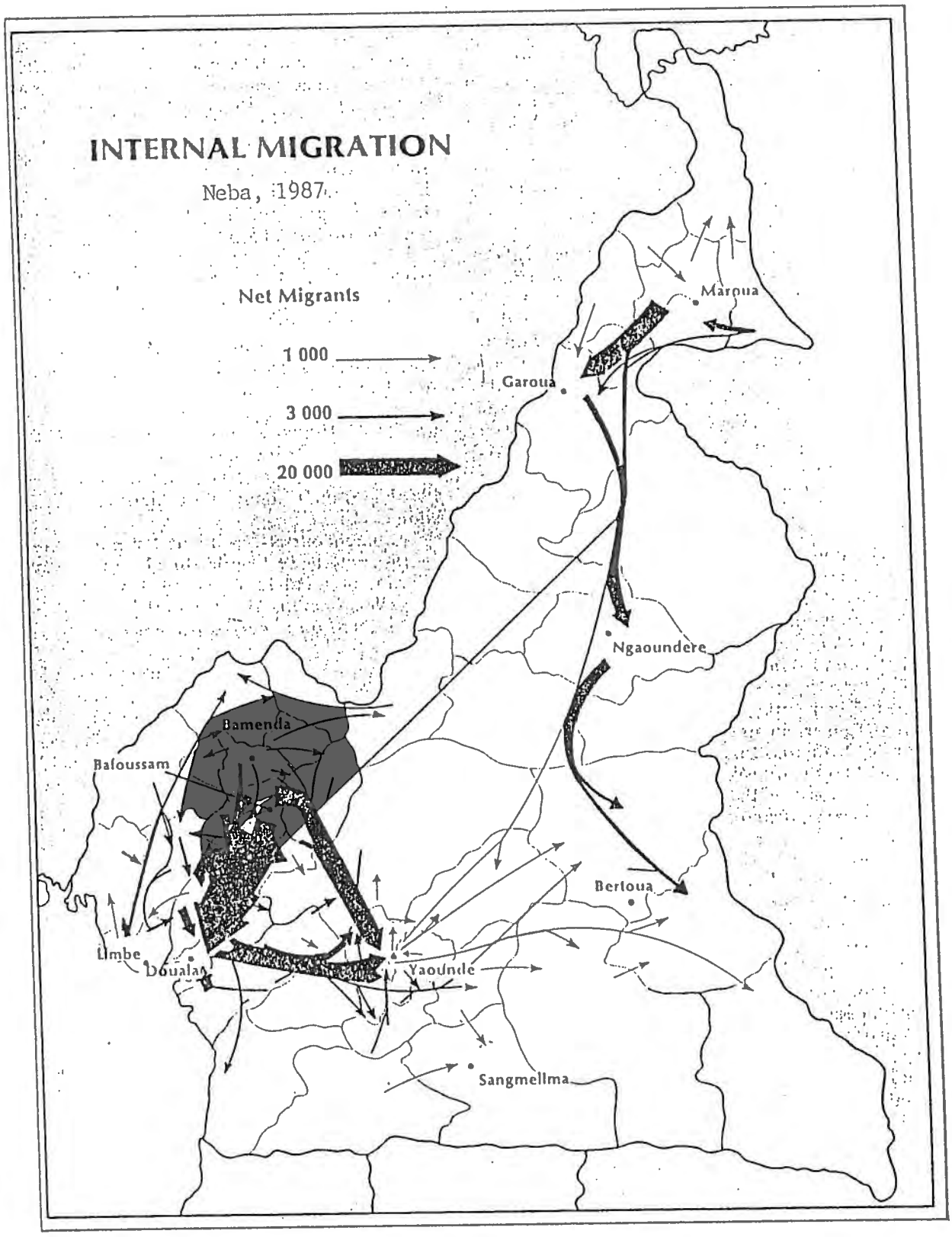
Average farm family size in Cameroon is 5.7 people. The largest average families were in the northwest (7.2 persons) and the west (6.8 persons) provinces. Farm labor is family-based, with an average of 3.6 persons which worked at least 30 days per year on the farms. Average hired labor accounted for only an additional 0.1 persons. The Northwest and West Provinces have the largest numbers of family workers since they have the largest families (MINAGRI, 1988).

Farming relies heavily on hand labor. The 1984 census reports that 85 percent of the farms use only hand labor. Twelve percent of the farms use cattle to cultivate the land, two use tractors, and one uses donkeys. Non-human power is concentrated in the

---

[2]The USAID 1990-1994 CDSS disputes the estimate owing to an error in calculation. In addition, the recent depressed Cameroonian economy has caused many people to return to the rural areas.

FIGURE 5.2


INTERNAL MIGRATION
Neba, 1987
Net Migrants
1 000
3 000
20 000
Maroua
Garoua
Ngaoundere
Bamenda
Baloussam
Bertoua
Limbe
Douala
Yaounde
Sangmelima

northern provinces. The total dependence on hand labor diminishes as farm size increases, but even on the larger farms (greater than 1 hectare cultivated area), over 60 percent of the farms depend on hand power only (MINAGRI, 1988).

The 1984 census also indicates that a substantial number of farmers who use farm machinery rented, borrowed or obtained from development projects. Such machinery includes sprayers (33 percent of farmers); plows, coffee pulpers, or carts (1 0 - 15 percent); and chain saws, tractors, or oil presses (less than 5 percent). SODECOTON influence in the northern provinces means a much higher use of tractors. More readily available farm animals means more plow use in the Sudano-Sahelian zone. About one-quarter of the farms owned transportation: bicycles (65 percent), motorcycles (23 percent), automobiles (6 percent), and trucks (2 percent).

5.3 FARM-LEVEL INCENTIVES AND DISINCENTIVES OF NRM INVESTMENTS

Policy intervention is a key. Sustainable agricultural interventions should focus on policy interventions. Policies should be established that restrict land-use and management practices so that farmers are encouraged to make management decisions that foster long-term resource productivity in the long-term interest of the country. If exploiting new land (extensive, shifting practices) involves lower costs and higher profits than investing in existing fields (intensive and sustainable practices), then short-term unsustainable management practices will be employed and the resources continue to be degraded. Forests will continue to be cleared for new agriculture fields.

Conservation and production interventions must be both coordinated and balanced. Land-use and management laws greatly affect the success of production interventions, such as infrastructure development, extension of agroforestry techniques, and market development for products. Likewise, production-fostering interventions must be at least compatible with and, still better, complementary to the land-use laws.

To encourage sustainable natural resource management practices, policies must aim to reduce the pressure on the land and to improve management practices. Reducing the pressure on the land is especially necessary in the densely populated areas where farmers are cultivating steep, highly erodible slopes. For instance, farmers can be encouraged to switch to less destructive crops (e.g. from roots and tubers to coffee on the steep slopes of the Northwestern and West Provinces). Unfortunately, both economics and gender relationships may discourage this option. Without a healthy tax-base, donor support may be necessary to provide subsidies until the economy improves. Creating land tenure and land-use laws to disperse the population and discourage destructive management practices may also reduce pressure on the land. Reducing population growth rate, currently at 3.1 percent per year, is also integral to this goal.

Improvement of management practices will allow more intensive, sustainable land-use. Such improvement will require better extension and education, as well as restrictive land-use and land tenure laws to prevent farmers from excessively expanding their farms. Where improved management practices increase farming productivity and profitability, farmers look to expand their farms to improve their livelihood still more. If the government of Cameroon decides to employ land tenure and land-use laws to control agricultural expansion into the southern forests and onto marginal, erodible lands in the north, it will have to choose a compromise between the most rapid increase that is possible in its people's standard of living with that of conserving its unique natural resources for future generations.

Sustainable agriculture and forestry goals of improved resource management and human welfare require land-use planning and infrastructure development to achieve equitable and politically acceptable compromises to land-use conflicts. Improvements in the national economy, commercial markets, banking system, communication, extension, education, health, and research are particularly important.

5.3.1 Labor

Agriculture in Cameroon is conducted mainly by uneducated hand labor: mostly women for food crops and men for cash crops. Mechanization and educational programs could greatly improve productivity. Mechanization could lead to unsustainable expansion of agriculture, as has animal traction has caused in parts of the Sahel. Improved farmer incomes through better farming practices and infrastructure development could encourage the renting of chain-saws to expand their fields, more labor-efficiently, into the forest. Mechanization should be approached with caution and controls.

5.3.2 Education

Cameroon has over one million small farms which present major problems in providing outreach and support in extension programs. The government's extension program is ineffective, leaving farmers to obtain information through commodity organizations and donor or NGO projects. Extension problems include:

(1) poor linkages with research;
(2) duplication of responsibility among organizations;
(3) inadequate training of agents;
(4) poor communication with farmers; and
(5) lack of transportation for extension agents.

People can be sensitized by television and radio, but training should be done by extension agents in the field. Introducing pest control measures to farmers is good way to capture farmers' interest for other, less spectacular interventions.

Commodity organizations (e.g., SODICOTON for cotton) have had dramatically influence farmers to use more modern cultural practices (MINAGRI, 1988). However, SODICOTON and other parastatals have accumulated large debts which leaves their existence in jeopardy.

Agricultural extension should focus on the largely uneducated small holder. In the northern provinces, programs should be directed more toward male farmers. In the southern provinces, extension organizations promoting cash crops should be oriented toward male farmers, while those occupied with improving food crops should target women farmers.

Gender differences (a preponderance of female farmers and of male extension agents) do not seem to pose a problem for extension as long as agents work through groups of women. In fact, women farmers appear to respond better to advice given by male agents than female agents (Russell, 1991).

In the southern provinces, women are the dynamic organizing group and should be targeted for extension programs. Through IITA programs, women have set up community fields to do agroforestry trials and are especially eager to try different varieties of crops.

5.3.3 Capital

Farmer's investment in agricultural mechanization, vehicles for transportation, and purchase of fertilizers is very low in Cameroon. Throughout Africa, agricultural profitability is so low that investment capital is placed elsewhere (e.g.,urban real estate, livestock, businesses, and foreign banks). This low profitability also affects the investment of human capital. Rural youth migrate to cities, leaving an aging farming population (according to MINAGRI; USAID disputes this). The natural resource capital, especially trees and soils, are being squandered through extensive agricultural and forestry practices. Those practices are reinforced by the economy, policy, and land tenure laws. Until farming as a livelihood can provide a standard living competitive with that of the cities, it is unlikely that major capital investments into farming will be made by small holders.

5.3.4 Markets

Lack of markets for agricultural and forest products is another feature of the loop in which Cameroon is currently trapped. Its diverse climate, wealth of agricultural and forest resources, and supply of ocean ports give the country a tremendous competitive advantage over other countries for marketing products. Once constraints are removed, a diversity of industries and potential economic efficiencies should be a magnet for investments.

Storage of agricultural products is a major constraint for farmers, and prevents them from exploiting the markets fully. Research into reducing storage losses to pest and

introducing food processing techniques would allow farmers more options in marketing their crops.

In the long term, marketing research could be directed to inducing foreign businesses to exploit Cameroon agricultural and climatic diversity and develop markets for new crops, following examples like avocados, artichokes, and kiwi. Thailand offers many fruit crop possibilities that currently have a limited world market.

5.3.5 Infrastructure

The country's concentration of populations allows more cost-effective infrastructure development, especially for transportation and communication, than for a dispersed population. This in turn could encourage agricultural intensification in the already deforested areas.

Credit and savings is a general problem for African farmers. Private commodity base organizations may be the short-term vehicle for farmers until the government of the banking system can provide attractive terms to farmers. These organizations also share some of the risks inherent in agricultural production.

Options:

- Time saved by improving labor efficiency should be directed into intensifying the agricultural system, not into expanding extensive agricultural practices.
- Agricultural extension programs should focus on the small holder.
- Marketing research could be directed to induce foreign businesses to exploit Cameroon agricultural and climatic diversity, and to develop markets for new crops.
- Increased access to credit and savings vehicles could be explored to help the African farmer.

5.4 NATURAL RESOURCE MANAGEMENT CONSTRAINTS AND OPPORTUNITIES

NRM will be treated as a luxury until the government views it as a long-term necessity. The analysis team had little opportunity to visit representative cases of successful agricultural and forestry NRM practices. However, two issues resonated throughout most of the interviews.

- The root cause of deforestation, soil erosion and the resulting decrease in soil fertility is the inappropriate natural resource policies and their implementation in the field.

- The weak Cameroonian economy offers few incentives for farmers to invest in agriculture (i.e., shift from extensive to intensive).

The poor natural resource policies and weak economy prevent any of field-level NRM intervention from being called a general success. Over the years, progress has been made in developing sustainable farm level intervention. However, their positive effects are most visible in those areas where environmental constraints, owing to population pressure and drought, out weight those of national policy and the economy. So in a sense, considering Cameroon's generally low population density and accommodating climate, NRM will be treated as a luxury until the government views it as a long-term necessity.

The activities listed below will encourage sustainable forestry and agricultural production. **USAID-Cameroon may wish to support the consideration/suggestions listed at the conclusion of this section.**

5.4.1 Natural Resource and Land-Use Planning

Natural resource planning and management is severely hampered by the lack of practical soil information, land tenure laws, and accessibility of collected information, especially that from the recent CIDA forest inventory. The opportunities outlined below coincide with those of the Cameroon CDSS, which expressed a possible need for a project to develop land-use and natural resource mapping and data analysis techniques (USAID, 1989, p. 59).

Soil Surveys

Soils information in Cameroon for the most part is of a general nature and is represented on small-scale maps. Little useful information is available for the agronomist and others on which to base farm-level recommendations for soil management. The problem is especially acute in the southern provinces, where dense forest and poor accessibility have limited the number of surveys.

In addition, most soil surveys are conducted without using the land-user's knowledge of the soils. Soils, therefore, are not described in terms of the units that are managed. There is little practical or historical insight on how to manage soils.

This historic approach to soil surveys has left gaps of information about the farming system. These prevent planners, agronomists, and foresters from optimizing land-use. Incorporating farmers' and herders' knowledge of the soil and land-use (ethnopedology) into soil surveys has provided very useful information in other parts of Africa.

Local soil classification systems exist in Cameroon. The soils identified have specific management practices associated with them and have commonly recognized names. For example, in the Far North Province there are Karals soils are black, clayey Vertisol; Hardés

soils are salty soils that are not cultivated; and Yaérés soils that are clayey and occur on vast flat floodplains. In forested areas, farmers commonly discriminate among soils based on surface color, and use names like black and red in their local language.

Ethnopedological surveys can particularly help Cameroon by:

- identifying natural soil-plant associations which can help foresters and agronomists pick sites for trees and crops;
- determining relative land values and land tenure relationships; and
- providing a better understanding of soil fertility and how fertilizers are and can be used.

Land Tenure Surveys

Natural resource tenure laws are important determinants of how the resources are used. Current laws encourage extensive agriculture and forestry practices which provide the best short-term benefits, but with long-term costs (i.e., preventable natural resource degradation). New legislation that will encourage sustainable management practices should be based on a good understanding of the current national and traditional laws and their relationship with the environment and the economy. The good laws need to remain; the poor ones should be changed.

Geographic Information Center

In order to develop multi-sector land-use plans and policy analysis effectively, spatial and temporal information needs to better organized and more accessible. The lack of donor and ministerial coordination in Cameroon makes this need especially acute.

5.4.2 Soil Fertility

Maintaining soil fertility is a major constraint throughout Cameroon and the major problem in the western highlands. The prerequisite to any soil fertility program is erosion control. Most of the soil's fertility occurs in the surface horizon, which has the greatest risk to loss from erosion. Once **soil conservation** is assured, then fertilization extension programs can show cost-effective yield increases, especially with more passive systems like agroforestry.

The variability of soil fertility must also be identified and described in terms of manageable units. Soil surveys have failed to do this. For example, the results of a soil fertility test can be extremely accurate, but still useless if the soils sampled are not representative of the lands that need to be managed.

In terms of vegetative system of soil fertility management, green manures and legume fallows appears more promising than agroforestry systems for the humid parts of the country (Baker, 1991).

ODA/ONADEF's Forest Management and Regeneration Project is planning to begin research in this area. It will including studying the differences in regrowth rates owing to soil fertility differences caused by soil degradation under different harvesting techniques. They will also study indigenous N2 fixing trees that may improve production of commercial species through mixed plantings.

5.4.3 Soil Conservation

Soil erosion is a major problem in the more densely populated areas with steep slopes (northwestern and western provinces), or problems with deforestation and overgrazing (far north province). Soil conservation should be a priority for any soil fertility improvement program. Contour cultivation, strip cropping, terracing are practices used in Cameroon that help conserve soil and maintain soil fertility.

Gartlan (1988) reported that many of Cameroon's water reservoirs used to produce electricity are showing signs of severe siltation through soil erosion. Excessive erosion in these reservoir watersheds will significantly reduce the period of time that electricity can be produced from these dams. Ninety-five percent of the country's electricity (13 percent of its total energy consumption) is hydroelectricity.

5.4.4 Agricultural Pests and Weeds

A main sources of risk and uncertainty is disease and pest attacks on crops, especially in the forested zone of Cameroon. Weeds and pests are major causes of yield decreases that drive farmers to move to a new plot under shifting cultivation. Weeds and pest find niches in newly opened ground and rapidly increase. In the forest zone, the most popular extension activity is helping farmers control pests and chemicals. What is needed are national and local plans for integrated pest management that will allow farmers to continuously cultivate fields for longer periods of time.

The 1984 census reveals that crop chemicals were used on 30 percent of the farms, predominantly on the export crops. Sixty percent of the cotton and cocoa producers and 30 percent of the coffee producers used chemicals. Only 2 percent of the food-crop farms used chemicals (MINAGRI, 1988). Pest control can be improved through better availability of pesticides and herbicides, along with informed use. Distribution systems of agricultural chemical can be improved by following examples from the fertilizer reform program (Minot, 1991).

5.4.5 Agroforestry

The most successful agroforestry systems in Cameroon still remain tree-crops such as coffee, cocoa, bananas, rubber, palm oil. These systems, where the tree is the major crop, hold much potential for improved productivity through research.

Agroforestry systems focused on nutrient capturing and recycling are not attractive to farmers in the humid forest when extensive agriculture is possible. Even when intensive agriculture is practiced, agroforestry for fertility maintenance must compete with the simplicity and immediate response of chemical and organic fertilizers. Other deterrents for using trees for this purpose are **competition** with the crop for light and water, and **difficulty in matching the labor requirements** with the existing farming schedule (Russell, 1991; and Yamoah, 1991).

Several organization are conducting agroforestry research. However, as yet there are no practices that can be extended to farmers in the forested and highland zones. Agroforestry research may be needed for as long as 10 years to produce research specific to farmer techniques. On-farm research may at least produce site-specific successes more quickly. Currently, for the forest and highlands, fallow cover crops seems to be the likely cultural practice that farmers will accept. A major constraint to research in these zones is the highly variable soil conditions and difficulty in site selection for tree species (Yamoah, 1991).

In the savanna zone, where threat of drought is on the minds of farmers more than soil fertility, agroforestry experiences mirror those of the Sahelian countries. The major constraints to agroforestry systems in this zone are low rainfall and competition with crops, conflicts in scheduling labor, protection from free-ranging livestock, and fear of fines for cutting trees. Rationalizing water conservation, extension, and appropriate forestry laws will encourage agroforestry successes in this zone.

Options:

- USAID may wish to support ethnopedological soil surveys.
- USAID could help fund a baseline study on which policy changes could be recommended. A collaborative study, for example among the Land Tenure Center at the University of Wisconsin, the French research institute ORSTOM, the environmental organization IUCN and the Cameroon government, would provide useful information.
- USAID has ongoing programs in geographical information systems (Systems Approach to Regional Income and Sustainable Resource Assistance, USAID/Clark University) which could form the model from which to develop a GIS center in Cameroon.

- USAID could support research projects which will reveal information about soil fertility and its variability.

- Soil fertility improvement programs could contain soil conservation as a priority. Hydroelectric watersheds could be considered as sites for soil and water conservation activities.

- USAID could support development of improved distribution systems for agricultural chemicals, as well as national and local plans for integrated pest management.

- USAID could support on-site farm research.

6.0 CAMEROON FOREST INDUSTRY

Cameroon is endowed with forest resources of immense, though not limitless, potential. The ongoing economic crisis has focused both national and international interests on the forest sector as a means to recovery. However, the lack of coherent policies for the sector and the inroads made by individuals seeking to make a living through farming and fuelwood compromise the potential of this significant resource. A balance of sustainable development and rational environmental (and therefore, forest) management is critical to success.

6.1 BIOPHYSICAL RESOURCES[1]

The forests represent a major economic resource to the country. The forests of Cameroon dominate the landscape. Forests cover about 20 million hectares, about 42 percent of the area of the country. Cameroon's forests produce many products, including timber for export and local processing; and construction materials for building; electric and telephone poles; and fuelwood. They also produce a number of non-timber "products": wildlife, fodder, medicinal plants, and food. Except for timber for roundwood exports and conversion to lumber, past and current harvest levels have not been well documented.

Cameroon is sixth in the world in tropical forest timber exports, and third among African countries. In 1985, timber exports were valued at about US$91 million, ranking fourth after oil, coffee, and cocoa. About 17.4 million hectares of tropical forestland is designated as exploitable; of these, about 40 percent (7 million hectares) have been allocated in concessions.

More than 300 tree species have been identified in Cameroon. Only 50 of these are exploited, and more than 70 percent of the volume harvested is composed of 15 species. This selection means that the average harvest per hectare is about 5 cubic meters.

In 1984, a total of 113 companies engaged in commercial forest harvesting. In 1984-85, the 47 nationally owned companies produced only 5 percent of the national harvest. Cameroon has introduced programs to encourage local processing. In 1985, local processing had reached approximately 58 percent.

---

[1]The data presented here underwent considerable scrutiny to determine its veracity. It was difficult to establish the stock and annual increment of timber volumes in Cameroon. This analysis relies on 1988 FAO/TFAP documentation. An accurate, more detailed inventory of the country's timber resources would be most useful.

The four vegetation zones (savanna, mountain forest, lowland semi-deciduous forest, and lowland evergreen forest) owe their current status and distribution to human intervention through land clearing for farming, the raising of livestock, fuelwood collection and wildfires.

Inventory data and estimates suggest that stem volumes range as follows:

- Dense closed forest 120 to 350 m^3/ha
- Sudano-Guinean Savanna 5 to 40 m^3/ha
- Sudano-Sahelian Savanna 5 to 25 m^3/ha

Commercial timber come primarily from the dense closed forest. Annual increment for this area varies by species but is estimated to average 17 m^3/ha. Though ingrowth in tropical forests can range much higher (to 25 and 30 m^3/ha/year), a prudent planner would limit increment estimates to between 10 and 12 m^3/ha/year. Traditionally, only 30 species have been harvested, and only twelve of these reach export markets. Three species have dominated production volumes ranging upwards of 90 percent of totals over most periods. If a broader range of species could be used, exploitable volumes could increase (assuming that their volume distribution and operability are favorable).

Roundwood use varies by region. An estimated 78 percent of Cameroon is under some form of forestry classification. Timber harvesting covers half (7,200,000 hectares) of the 40 percent of the country covered in closed forests. This area provides virtually all industrial roundwood (which reached 2,000,000 m^3 in 1985 and has ranged slightly above that level since then) produced in the country.

6.2 THE FOREST INDUSTRY SECTOR

The country's forest industry has developed largely as a factor of access to the resource, primarily through new rail and road construction. The foreign investment and log exports have dominated development. Fuelwood currently demands four times as much as industrial use.

6.2.1 Industry Background

Access to the resource keys development and exploitation. Foreign direct investment in log extraction and export currently dominates forest industry development in Cameroon. This pattern has prevailed since the beginning of this century. **Table 6-1** characterizes this activity. Noteworthy increases in production activity after 1925 and 1969 are attributable to improved rail (and some road) access. Of 70 cutting permits in existence by 1934, only two (near Yaounde) did not have rail connections (of which 48 did) or nearby navigable rivers (of which 20 did).

Table 6-1 Wood Products: Production and Exports

Year	Production Logs/Lumber	Export Logs/Lumber
1966	655,000 m^2	26,000 t
1967	710,000 m^2	37,000 t
1969	730,000 m^2	38,000 t
1971	800,000 m^2	
1975	1,000,000 m^2	472,000 m
1980	1,613,000 m^2	743,000 m
1981	1,700,000 m	444,000 m
1982	1,707,000 m	448,000 m
1983	1,776,000 m	391,000 m
1984	1,923,000 m	496,000 m
1985	2,093,000 m	746,000 m

Increasing pressure on the country's forest resource base in the 1990s stems from the same phenomenon: improved direct access to exploitable commercial timber volumes. Typically, hauling distances to mill sites range between 40km and 100km. Some licensees have forestalled extraction operations because of the economics of building a remotely located mill or of hauling logs over hundreds of kilometers.

Foreign influence and opaque policies characterize development. Except for post-1988 trends in a few areas, increased harvesting levels and movement into new areas of the country have been essentially the only change in industry activity. Past development trends display common features:

- Increased harvesting stemmed from opportune access.
- Dominance of foreign investment in logging and conversion facilities.
- The timber concession allocation system did not operate transparently.
- Convoluted taxation schedules and low collection rates made it difficult to calculate costs.
- Producers exported to European markets.
- Producers installed a minimum of domestic conversion capacity.

Parastatal mechanisms hampered private sector development. Beginning in 1969, the public sector tried to develop domestic conversion through the parastatal corporations. Their performance benefited from the usual mechanisms to support infant industries, most

of which protect local investment from competitive markets and, thereby, remove incentives to maximize efficiency, and social benefits.

The pervasiveness of parastatal organizations in Cameroon in several commercial fields presented and presents a serious obstacle to private sector participation. Even donor community participation evaporated, starting in 1980 when the full extent of the problem became apparent. One of the two more spectacular failures involved CELLUCAM (Cellulose du Cameroon), liquidated only a year after commencement. Another, SOFIBEL, (Societé Forestière et Industrielle de Balabo), is now subject to the reforms of the SNI (Societé Nationale d'Invetissment) and faces rationalization, liquidation or privatization.

6.2.2 Forest Depletion for Other Uses

The forestry stock is currently being used faster than it can be replaced. Two of these uses threaten the viability of the forestry industry.

Fuelwood Production

Fuelwood (firewood) is an important energy source and a fallback economic resource for farmers. Fuelwood is the main domestic use of roundwood in Cameroon. Current consumption is about 8,000,000 m^3/year. Fuelwood demand is highest in areas able to sustain it. A sustainable source of fuelwood or an alternative is an urgent need for Cameroon. By the year 2000, when the population is projected to exceed 15.6 million, Cameroon's fuelwood consumption is expected to more than double by then.

Fuelwood consumption varies from region to region, depending on available resources and population pressure. In the South and Southeast provinces, an abundance of free forest resources supplies the needs of the scarcely populated area. The northern savannah zone is heavily populated and sparsely forested. Fuelwood consumption is about 3 million cubic meters per year. Fuelwood shortages are developing there. The greatest pressure will come from the one-third of the country in the Central, Coastal, West, Northwest and Southwest provinces where between two-thirds and three-quarters of national fuelwood consumption and marketing takes place.

One of the major fuelwood centers in northern Cameroon is the city of Maroua. L'Association Bois de Feu in Maroua provided the following figures on local demand.

Firewood Prices in Maroua

Oct.-Dec. 1989	CFA 28.5 per kg
Oct.-Dec. 1990	CFA 20.9 per kg.

Quantity consumed in Maroua	
1989	33,000 tons
1990	37,000 tons

The increase in the quantity of fuelwood offered and consumed in Maroua and the associated drop in price were blamed indirectly on the economic crisis and on the fall in world commodity prices. Farmers who failed receive needed price support subsidy payments turned to fuelwood harvesting to supplement their cash incomes. This activity increased the quantity of firewood offered in the market and forced down the price of fuelwood. The government has announced a policy of phasing out the price support program. If commodity prices remain depressed, the farmers will continue to harvest and sell fuelwood, putting additional pressure on the limited quantity of wood available.

Fuelwood harvests and government regulations increase the impact on natural timber resources. No farmer yet grows fuelwood plantations because it is still cheaper to buy it on the market. However, fuelwood is becoming increasingly scarce in some areas and market price are increasing, especially on the savanna. The consequences are:

- The retreat of natural vegetation around villages and longer travel distances to existing wood.
- Increasing use of agriculture by-products for fuel instead of fertilizer.
- Excessive pruning of fruit trees for fuel.
- Increasing and excessively high fuelwood prices.

Present forest concessions are granted for renewable 5-year periods, which discourages any investment into the forest by the lessee. Longer-term forest concessions, with governmental land management requirements, would encourage more sustainable forest management. However, there are only meager forest research results from which to direct policy decisions, a major constraint.

In the northern savanna area of Cameroon, especially in the Far North Province, the enforcement of wood cutting laws is preventing farmers from planting trees. Farmers feel that planting trees means planting them for the government, because some forestry agents are exploiting the forestry laws. Similarly, in other Sahelian countries, the forestry agent can impose a fine on the farmer for cutting a tree that he or she planted: trees are therefore not planted. Even tree plantations are not immune from the agents. Management of tree plantations fall under the responsibility of Direction de Forêts, which issues cutting permits to exploit the trees. Consequently, many of the plantation go unmanaged and unexploited (see especially the Moroua area). There are many other examples, especially in Niger and Burkina Faso, where tree tenure agreements were set up with the Forest Services through projects so that farmers were assured rights to no-fee

exploitation. These agreements and resulting forest management have been worked out at both a national and local levels but always through projects.

Food Production

Forest land is being subsumed for non-sustainable agricultural uses. Cameroon has a population of approximately 9.9 million (1985). The population is growing at a rate of approximately 3.1 percent per year (1973-1984). At this rate the population will reach 15.6 million by 2000. An increasing population increases the pressure on the land for agriculture production.

The increase in land dedicated to permanent agriculture is not severe. Permanent farm land is being cleared at a rate of approximately 8,000 hectares per year. In contrast, between 75,000 and 95,000 hectares are cleared each year for slash-and-burn farming. These activities are compatible with sustaining forest resources, so long as the fallow period is long enough to allow the forest to recover. Unfortunately, with increasing population pressures, the fallow periods have been shortened. This result in soil depletion, erosion and environmental degradation.

6.3 ECONOMIC PLANNING

6.3.1 Increased Yield

Some return has been demonstrated for superior-stock planting. At the Forest Management and Regeneration Project sponsored by ONADEF in Mbalmayo, the assessment team visited the surrounding forest, which had been planted and managed over the previous 50 years. A researcher working on the project for a plantation of Parkinsonia, a white wood that had been planted 33 years ago, provided the following information. The market value was the current value on the local market.

Age of stand	33 years
Volume of stand	200 m^3/ha
Market value of the timber	CFA 5,000 /m^3
Net value of commercial thinning and conversion to charcoal at age 15	CFD 190,000 [CFA?]
Cost of Planting superior stock	CFA 300,000/hectare

Assuming that superior stock will increase the yield by 30 percent and produce 260 cubic meters in 33 years, as estimated from the results of the research program, the cash flow will be:

Year 0	CFA -300,000
Year 15	CFA 190,000

Year 33 CFA 1,300,000

The internal rate of return generated by this cash flow is approximately 5.5 percent. Although this return is not very attractive, given current alternatives, it does justify additional study. Other species with higher market values could increase the return.

6.3.2 Economic Resource Stock

Estimating timber as a true economic resource is seriously hampered by lack of data and inadequate methodology. The physical stock of timber volume is not identical to that which is economically accessible. Volume estimates do not appear to have been derived through a rigorous process. Without sample plots, it is extremely difficult to obtain accurate volume calculations. No such plots are in place in Cameroon. Instead, expert sources provide estimates, although these appear to bear little relation to current realized volumes. Costs for access and transport vary across the industry, and introduce an element of unpredictability (and risk) into the quantification of the economically available stock of timber in Cameroon.

Option:

- Donors could support projects that will improve the calibre of the estimates used to calculate sustainable economically recoverable timber volumes.

6.3.3 Resource Valuation and Taxation

Cameroon today is subject to a number of significant problems in resource valuation, in part because markets are not freely developed and integrated. Taxation and forestry fees are collected to redistribute benefits, but mechanisms are not reliably tied to use or actual value.

Resource owners receive less resource rent than they should. Those who convert the base value of forest resources into the intermediate and final products must each be compensated for his or her contribution. So long as markets are not distorted, the distribution of compensation will be "fair." Where barriers to competition exist, their impact can be felt throughout the distribution of the benefits from the forest resource.

The best way to award timber cutting rights in a competitive market place is a public auction. A desirable goal towards liberalizing the country's timber allocation mechanisms is to increase its transparency by placing greater emphasis on market influences to direct the flow of timber resources.

Aside from establishing appropriate levels of taxation and fees, resource rents can only be redistributed to the extent that they are actually collected.

Current tax structure is more complex than is necessary for desirable assessment and collection goals. Such goals should include measures to insure proper consideration of the following factors:

- equity,
- ease of assessment (preferably on an ad-valorem basis reflecting market prices),
- automatic annual (or quarterly, where possible), indexing to inflation and
- sanctions for non-remission (e.g., interest charges, fines, suspension of operations, cancellations of concession, depending upon the gravity of the arrears).

Policy reform in forest sector development is a prime consideration. Among the more important are:

- alleviation of an environmental degradation pressures;
- the creation of an integrated domestic value-added sector and provision for forest management, and
- legislation that will ensure the sustainability of the resource and the benefits it provides to society.

The issue of entrepreneurial confidence is also critical, and crosses into decisions made by both public and private sector participants. The past years of "planned liberalism" failed to provide the positive signals upon which a nation's economic success is usually based. Measures that will instill confidence must head the list of goals driving the changes contemplated for the liberalization and growth of Cameroon's economy. In their absence, development potential is likely to be curtailed and its broader objectives compromised.

Options:

- Greater emphasis could be placed on market influences in directing the flow of timber resources.

- Measures could be fostered which encourage private sector entrepreneurial development in the industry.

6.3.4 Implication for Sectoral Development

Reform of the country's tax and forestry fee structure can have a major impact upon the development of a sustainable industry, forest management and resource conservation:

1. Where concession fees are not open to market scrutiny, unofficial rents can be extracted, potentially diverting cutting rights away from a more efficient operator and compromising net social benefits.

2. A fee structure that understates resource values (i.e. preserves unextracted rents) promotes waste through high-grading. This recoverable material has been estimated to exceed 50% of felled volumes in some areas of the country.

3. A per-stump fee promotes rational use as do volume-based field waste assessment. Each are easily incorporated into harvest management activities and each is readily definable.

4. In the absence of a purposely built tax and fee structure, the level of extractable rents available through timber exploitation is overstated. The development of a non-timber products sector that may have higher legitimate rents and produce a higher valued stream of overall benefits may be foregone.

5. Tax reform will alter the revenue structure of the private sector. The traditional pattern of participation by foreign interests will change. Further development of the forest industry must rely on new foreign and, ideally, far greater domestic participation in this sector.

6. Taxation can be an effective mechanism to promote the development of a domestic value-added sector. Part of this policy would be a phased tax increase on roundwood exports. Tax consideration for the installation of conversion capacity and creation of employment are further incentives. These could be construed as a trade-off of resource rents to the private sector in return for accepting some measure of public sector social burden.

7. Taxation policy can also be used to promote the use of non-commercial species through the provision of tax holidays for a defined product and market development program. A program should incorporate mileposts and performance criteria to justify continued tax relief. The contribution of this program to resource conservation through increased recovery is clear.

8. If plans to increase forest sector activity in Cameroon are to materialize, allowances must be made for the cost of constructing of complementary transportation infrastructure. The history of central planning in the country has had little impact on fostering such activities. Production capacity, as well, has benefitted little from domestic savings and investment.

9. If Cameroon is to manage forests on a sustained basis, regeneration must follow harvest. Despite an abundance of species in the tropical forests of Cameroon (botanists have identified more than 500 species), very selective harvesting focuses on the few worth cutting. After several rounds of cutting, the remaining species are unlikely to be the most marketable. One method of assuring that sufficient marketable trees are available in the future is to regenerate the area by planting seedlings of the desired species.

10. Immediate action is needed to minimize the impact of fuelwood pressure in areas where shortages are developing. By addressing other resource issues through increasing species utilization, increasing volume recovered per stem, increasing recovery and use of woodlands and saw milling waste wood material, authorities will also contribute to diminishing of the impacts of fuelwood demand.

6.4 TROPICAL FOREST RESEARCH

Forest regeneration research is of prime importance. Tropical forest management is complex. Species composition differs by region, site quality, and slope. Each forest is unique, and, although forest management principles are the same, management must be site-specific. Thus there is a need both for technical knowledge and for skilled foresters and forest technicians to apply that knowledge to each stand. Research is needed in two areas: the development of growth and yield response by species, site conditions and treatment prescriptions; and affordable regeneration techniques which will produce a satisfactory stand.

Stock and stand tables provide volumes by species, by age, by site. These tables are needed to project future volumes so that stands can be managed and harvest schedules planned. Sound regeneration techniques are also important. If tree harvesting is light and non-selective (like natural mortality), the forest will regenerate itself and the original species composition will remain constant. With selective harvesting, concentrating on the few marketable species (50 out of 300), the forest composition will gravitate towards the production of non-market species. Thus it is essential that forest regeneration research such as observed at the ONADEF project in Mbalmayo continue and receive adequate support.

Cameroon has allocated some of its forest land though various concessions to private forest companies. If the concession is long term, the company usually assumes some of the forest management responsibilities. Although regeneration is not mandatory in most concessions, Cameroon may decide that regeneration is the responsibility of the harvester. (The government cannot demand as much rent recovery if regeneration becomes a cost of harvesting, but that may not be an important issue.) If regeneration becomes mandatory, than planting superior stock is most desirable. This makes policing of the regeneration efforts easier and increases the probability of a satisfactory residual stand. Thus the practical research conducted in the regeneration program in Mbalmayo is essential for the sound management of tropical forests if the responsibility of management is given to the concession holders.

An existing training center provides a model for expansion. The Centre de Promotion du Bois, a small training center, instructs local workmen to use wood processing machinery, experiments with species not currently used in the market, and promotes the use and acceptance of these species. This is a step in the right direction. Assuming that

600 species of wood are available in Cameroon, only 50 of which are used in local and export markets, there is a real scope for experimentation. The center could turn a profit, and the wages could be tripled. This plant could be used as a prototype across the country to train wood-machining operators. The plants could than be turned into profit-oriented units which could make a substantial contribution to a rural community.

7. ROLE OF PRIVATE VOLUNTEER ORGANIZATIONS (PVOs) AND NON-GOVERNMENT ORGANIZATIONS (NGOs) IN NATURAL RESOURCES MANAGEMENT

As the economic crisis reduces GRC capability for effective government action in this arena, the increase in PVOs and NGOs offers opportunities for direct, effective action in natural resources management. The government has traditionally taken a paternalistic approach to development through government organizations. However, this tendency is gradually giving way to Local Development Initiatives (LDI). Recent trends show that international NGOs, national NGOs and village associations are taking on more important challenges and programs.

Ten years ago, only a handful of international NGOs operated in Cameroon. Today, there about 20 International NGOs and voluntary organizations, 150 indigenous NGOs, and 400 rural and village organizations involved in natural resources management and development projects. However, they are constrained by outdated policy and legislative contrext on one hand, and by inadequate funding to initiate programs leading to sustainable development on the other.

All NGOs working in Cameroon today aim to improve the quality of life of the people through their activities in integrated rural development: agroforestry, piped water systems, soil fertility, reforestation, agriculture, parks development, etc. Their size and approach differ according to philosophy, financing, technical and institutional capacities.

If the government were to adjust and review its development strategies and create a better environment and opportunities for the NGOs and village associations to operate, positive effects could increase dramatically.

The discussion below centers on the kinds and influences of these organizations. For detailed coverage of ongoing donor projects--local, national, and international--see **Chapter 8.0.**

7.1 LOCAL NGOs

Cameroonian PVOs have not been heavily involved in the conservation of biodiversity and tropical forest. They concentrate on rural development and do not specifically link projects to the protection of natural lands. The indigenous conservation organizations that are currently active are new on the scene (Augustin Youmbi, pers. comm.). This is consistent with the earlier survey conducted by Talbott (1988).

A wide range of indigenous PVOs is involved in natural resource management:[1]

- Cercle International pour la Promotion de la Création,
- Association for Creative Teaching (ACT),
- Comité Diocesain de Développement (CDD),
- OCIDRK (explained as Promotion Collectives des Initiatives de Développement),
- Bafut Village Community, CIPCRE (no explanation),
- Action pour le Développement de la Communauté (APODEC),
- Communauté de l'Emmanuel, LOCOCAM (a waste treatment organization),
- Federation des Groupement Agricoles et Association de l'Est (FEGAR-EST),
- SOLIDAM (training and community education),
- Centre pour le Développement Auto-Centre (CDAC), and
- Association Solidarité d'Idées dans l'Action, CIPOD (farmer training).

Of these indigenous organizations, none is primarily directed towards conservation.

Although indigenous NGOs have grown in size and number, they remain heavily national. Indigenous NGOs and rural associations have a near one-hundred-percent Cameroonian membership in the conceptualization, management, and execution of their set objectives, even though some of these indigenous NGOs are able to receive funding from both international and national sources. Over the past 2 years, indigenous NGOs have grown steadily country-wide, and especially in the Southern part of the country.[2] The growth may be attributed in part to political unrest and the consequent gradual decline in popular support for the numerous parastatal development agencies. It may also have increased as the government has decreased its financial support of government institutions.

Rural and village associations, especially in Western Cameroon, represent the largest category of NGOs. Since about 50 percent of Cameroon population is rural, village organizations touch on the lives of most citizens. However, these associations lack funding, experienced management, skilled manpower and well-defined structures. More rural/village NGOs tend to be sustained in the former Anglophone Cameroon, where community

---

[1]One group listed as international, Enviro Protect, is Cameroonian in origin and present scope (Augustin Youmbi, pers. comm.). Enviro Protect started early in 1991 and concerns itself with public awareness, training, and research. It has no present projects that are associated with protected areas.

[2]Indigenous NGOs are relatively scarce in the Northern provinces; in particular, women organizations are conspicuously absent. Reasons for this have not been definitively established. Moslem women are actively involved in production and management of natural resources, but not in project activities.

development activities has had a historically strong foothold. Village organizations were encouraged and developed through community development agents. This may explain why there are better organized village organizations in the North-West and South-West provinces (Anglophone region) and, to a degree, in the West province than in the other provinces. In the three Northern provinces (North, Adamawa and Far-North), missionary organizations have been at the forefront. In the Centre, South, East and Littoral provinces, there is increasing evidence of active development of rural and village associations.

7.2 INTERNATIONAL PVOs

International PVOs include conservation and education in their NRM work. International PVOs in Cameroon include CARE, World Wildlife Federation (WWF), Catholic Relief Services (CRS), and Save The Children Federation (SCF). These organizations work on many facets of rural development, including natural resources management: agroforestry, erosion control, soil conservation, the fight against desertification, and so on.

CARE leads the international PVOs in field experience, number of projects and area of coverage. It operates in four provinces: North, Adamawa, Far North, and East, where it has development projects in agroforestry, water and reforestation. With ONADEF, CARE sponsors an agroforestry project in Mokolo. The project appears to be oriented towards extension of knowledge and techniques, a key element missing in many of the programs observed. Knowledgeable people are present, but there appears to be very little effort to transfer the knowledge to those who could use it. New programs should concentrate their efforts on extension. The most credible approach is to use local staff with both the knowledge and the ability to transfer the knowledge.

WWF has been concentrating on parks development, notably in the Southwest province (Korup National) park. Both CRS and SCF are also involved in rural development, especially in training.

Volunteer organizations are also moving into natural resources management activities in rural development in Cameroon. The Association Française de Volontaires de Progrès (AFVP), the German Volunteer organization, the Peace Corps, SNV, OCSP and the Swiss Association for Development and Cooperation (Helvetas) are active in the field.

7.3 PVO-NGO\NRMS CAMEROON PROJECT

The Private Voluntary Organizations and Non-governmental Organizations in Natural Resources Management Support Project (PVO-NGO\NRMS) has fashioned a solid organizational base in Cameroon. In 1989, a consortium of US-based PVOs (CARE, WWF, and EIL began this major natural resource management project in Cameroon.

Funding is provided by USAID. The project funds primarily collaborative training, technical assistance, and information exchange.

The PVO-NGO/NRMS office in Cameroon has four primary activities (project brochure, "Goals and programs in Cameroon", dated September 1990; Ada Ndeso-Atanga, pers. comm.):

- organizing quarterly meetings of the Country Working Group,
- conducting workshops in natural resources management and agriculture,
- putting out a quarterly newsletter, and
- awarding small grants.

The program brochure identifies the following key natural resource management issues in Cameroon:

- fuel wood,
- slash-and-burn farming,
- desertification,
- land and tree tenure, and
- protected areas and integration of surrounding areas.

In terms of conservation of biodiversity and tropical forests, the program seems thus far to have focused on conservation education.

Two organizational structures guide the project. The first project task was to develop a framework to carry out the main objective of enhancing the institutional and technical capacities of NGOs in natural resources management in Cameroon.

Two important structures were put in place: a Lead Agency (originally EIL, but now CARE) and a Country Working Group (CWG). The CWG has 15 [14] members. CARE, WWF, Catholic Relief Services and Institut Africain pour le Développement Économique et Social (INADES) constitute the international NGOs. Association Française de Volontaires de Progrès (AFVP) is the only "voluntary" organization. The remainder are indigenous NGOs: Living Earth, Centre Rural d'Appui Technique de Saa (CRAT), Jeunesse Agricole Chrétienne (JAC), Service d'Appui aux Initiatives Locales de Développement (SAILD), Union des Groupement Communautaires d'Esse, Centre d'Études, de Recherches et de Formation à l'Auto-Promotion (CERFAP), and Association pour la Promotion des Initiatives Communautaires Africaines (APICA). Two donor organizations, the Africa 2000 Network and USAID were given observer status.

None of these indigenous organizations is primarily concerned with conservation. Of the international organizations, Living Earth is primarily concerned with conservation education (Augustin Youmbi, pers. comm.); and WWF Cameroon is concerned with all aspects of conservation.

Solid progress has been made. The major tasks of the CWG are: to develop an annual plan of action, including training sessions and information exchange activities; to define the criteria for selection of projects submitted by NGOs or community-based organizations in Cameroon; and to provide follow-up on these projects. During the first year of operations, over 120 organizations active in environmental activities have been identified. Several new groups have been established, including a national consortium of environment groups. These groups have submitted over 30 project proposals for training and demonstration projects in 6 months.

For example, in the most recent round of grant awards (letter, May 2, 1991; Adamma Ndeso-Atanga to members of the CWG), eleven proposals were considered. Grants were made in the areas shown in Table 7-1:

Table 7-1. PVO-NGO\NRMS Grants

Farmer training	(1)
Erosion	(1)
Agroforestry	(3)
Environmental education	(1)
Development of NGO associations	(3)
Cooperative market gardening	(1)
Environmental protection workshop	(1)

Grants are made for small projects involving natural resource management and environmental protection (project brochure). The maximum award is 6,000,000 CFA.

The project is organized by ecological zone. A number of approaches were used by the CWG network to identify organizations, environmental issues, and organizational needs. Information-sharing meetings were held in the three major ecological zones in the country. Subsequently, three decentralized NRMS sub-groups were organized, with community-based organizations as full members and research and some government institutions as associate members. PVO-NGO\NRMS has four working units:

- Yaounde NRMS CWG.
- Savanna NRMS Group-North, Adamawa and Far-North Provinces with 19 members. International NGOs and missionary-led organizations predominate.
- Tropical Highlands NRMS Group-North-West, West, Littoral and South-west provinces with 18 members. Indigenous organizations with grassroots participation offer a promising avenue for future work.
- Dense Forest NRMS Group-Central, South and East provinces, with 31 members.

An Inventory of Problems and Constraints

Each of the three NRMS geographical groups identified problems, needs, and issues that affected each either specifically in its eco-geographical region or generally.

All NGOs identified the lack of managerial and administrative skills and manpower. They cited their need for training in project development and management particularly. For many years, rural associations and village organizations were dependent on government handouts and financing. Local initiative was stifled. Now they seek active training to be able to carry out their own ideas, as the government is less able to support activities. These and other identified needs are listed below.

Tropical Highlands Ecological Zone -- Problems, Issues and Needs

1. A need for agroforestry interventions, erosion control, and crop diversification (for better farm management).
2. A need for income-generating schemes (especially for women who are responsible for most of the farming in the area, but not the sale of production).
3. The disappearance of the pygeum africanum tree exploited for its bark for medicinal purposes. (The tree is exploited commercially through permits provided by the Ministry of Agriculture. The tree could be a source of income for the area and residents of the Kilum area could be organized to monitor exploitation. As it is, the tree is overexploited and often even destroyed due to overcutting. There appears to be no vested interest in those who are licensed to preserve the tree.)
4. A need to review government policies of Forestry exploitation to take into account the rights and needs of the local population. (The government should recognize the increasing need for communities to play a greater and more responsible role in the management of their natural resources.)
5. A need to develop and introduce appropriate low-input technologies for sustainable and productive agriculture.
6. A need to improve rural infrastructure (roads, storage and marketing facilities.)
7. Need for education/training.

Dense Forest Zone -- Problems, Issues and Needs

1. A lack of information exchange among members about their different activities in natural resources management.
2. Limited funding available for projects and training.
3. Need for education and training.
4. Soil degradation.
5. Overexploitation of certain animal species.

6. Lack of technical/managerial skills.
7. Deforestation; lack of planned forest exploitation
8. Bush fires.
9. Water sources lost to pollution or erosion.
10. Lack of infrastructure and difficulty in communications and travel.
11. Leadership problems within organizations.

Savanna Zone -- Problems, Issues and Needs

1. Desertification, erosion, poor soils management.
2. Uncontrolled bush fires.
3. Lack of water.
4. Government forestry policy conflicting with traditional norms of the Northern people.
5. Education and training.
6. Absence of rural and village associations in natural resources management.
7. Inadequate infrastructure in the area of parks development.

7.4 LEGISLATION AND POLICY CONTEXT OF NGOs

NGOs have been hamstrung by centralization of authority in the Ministry of Territorial Administration. Discussions with Cameroon policy makers suggest that there is no legal framework to regulate the formation and operation of NGOs. Consequently, talking about NGOs and natural resources management in Cameroon implies a host of government structures and ministries: Agriculture, Mines and Energy, Tourism, Planning and Economic Development, Education and Territorial Administration. These government ministries tend to have specific pieces of legislature limited to their areas of concern.

In the absence of a specific, coherent legal framework for NGOs and natural resources management, laws governing the formation of associations in the Ministry of Territorial Administration have been used to regulate their formation and approval. These laws emphasized government authorization in the formation and approval of any association. This state of affair directly impinges on the activities of both international and indigenous organizations. Bureaucratic requirements hit hard at rural and village organizations involved in development programs since they lack experience and spare time to master the paperwork.

However, the laws passed in December 1990 simplified requirements for associations to a simple declaration on the part of the group concerned. The COPAD (National Federation of all NGOs in Cameroon) proposes legislation for the formation of NGOs, cutting out the role of the Ministry of Territorial Administration.

Options:

The following options stem from the PVO-NGO\NRMS Project supported by USAID. For more background on PVOs/NGOs and on these options, see Appendix A.

- The Mission could support revision of existing legislation regarding NGO status, land/tree tenure, and timber extraction.

- USAID could work in partnership with NGOs, government organizations, and resource user organizations to institute a consultative process, promoting dialogue and reflective analysis as an integral component of NRM.

- The Mission could support a movement to consistency in legislation pertaining to NRM across the involved line ministries in Cameroon: Agriculture, Tourism, Mines, Water and Energy, Plan and Education.

- USAID could provide NGOs and grassroots-level farmer/village associations and federations with the technical and managerial skill to succeed.

- The Mission could support innovative micro-level projects testing new technologies or methodologies which could manage natural resource more sustainably and promote equitable development.

- USAID could promote skill transfer between international and national NGOs.

- The Mission could explore the feasibility of channeling funding increasingly through NGOs to achieve development objectives, as an alternative or complement to channels to government organizations.

- USAID could develop a long-term strategy (5 - 10 years) for funding of an NGO program in natural resources management.

- The Mission could provide both the flexibility and consistency in committed programming to advance the community's capability to contribute to sustainable development in Cameroon.

8.0 DONOR ACTIVITIES IN NATURAL

RESOURCES MANAGEMENT

USAID and a variety of national and international sources have intervened to address the practical and structural threats to natural resources and to develop a proactive approach to future planning. They have experienced a variety of successes. The sections below establish measures for success, delineate fields for action, and describe the range of projects and opportunities.

8.1 CRITERIA FOR JUDGING CONTRIBUTION TO CONSERVATION OF BIODIVERSITY AND TROPICAL FORESTS

Direct and indirect contributions can be measured by increase in a resource or by maintenance (where it would have declined). Direct conservation activities are those specifically and successfully designed to conserve biodiversity and/or tropical forests or to replace their non-sustainable exploitation by sustainable use. If other development activities have such side-effects, they can be considered as indirect contributors.

The success of a contribution to biodiversity can be measured by the associated increase or active maintenance of the numbers, evenness, distribution, or population sizes of indigenous biological forms. Active maintenance is the difference between observed changes in biodiversity and the estimated changes that would have been observed without intervention.

Successful contribution to tropical forests can be measured as amount of increase or active maintenance of the extent of forests, or of their natural species composition or ecological function. Because tropical forests tend to be particularly rich in biodiversity (e.g., Wilson 1988), development activities may contribute to the conservation of both components at the same time.

8.2 DIRECT AND INDIRECT CONSERVATION AND REPLACEMENT ACTIVITIES

Conservation and development activities directly related to biodiversity and tropical forests in Cameroon may be divided into four categories:

Protected area projects can include park or reserve management, associated local rural development, and surveys of areas that may deserve protection. This is the category most immediately related to conservation.

Training and research refers mainly to support for institutional programs in disciplines related to conservation, such as biology and its subdisciplines, and for individual participation in such programs.

Conservation education means informal public information programs or programs aimed at primary or high school students.

Natural lands management refers to applied research and projects that seek to use natural lands without altering their natural characteristics. Examples are studies of the regeneration of indigenous species, promotion of the sustainable harvest of natural forest products including sport animals, and nature tourism. This category is least direct, but not necessarily least important in the long term.

Indirect contributions may be defined by example. Natural lands management further intergrades with indirect contributions. The latter promote alternatives to the destructive use of natural resources. For instance: fuelwood plantations on previously cleared land may reduce the demand for fuelwood from natural forests; soil conservation projects in agricultural areas may help to maintain the natural fertility of the soil. Where these activities are intentionally coupled with conservation (as in integrated conservation and development projects that coordinate conservation of a reserve and rural development in the surrounding human communities), they may be considered direct contributions to conservation. Where such activities are not explicitly coupled with conservation, their effects are likely to be very difficult to assess: they are better classed as indirect contributions.

8.3 PRESENT CAMEROON PROTECTION EFFORTS

Present legal protection of biodiversity and tropical forests is effectively confined to the seven national parks and the four intact wildlife reserves.[1] These include areas of savannah and lowland evergreen forest, but not mountain forest or lowland semi-deciduous forest. A new park and a protection forest have been proposed that would include these unprotected ecological communities.

Current efforts in all four areas are beginning to effect changes. Direct contributions to biodiversity and tropical forests include the following:

---

[1]Technically, there are nine wildlife reserves; however, two have been destroyed, one has been degraded by 50%, one is currently open to timber concessions, and one is in process of being declassified. Within legally protected areas, conservation is weakened by lack of infrastructure and equipment. At the policy level, conservation is complicated by inadequate laws and division of authority among ministries (see **Chapter 4.0**).

1. **Projects in integrated conservation and rural development:** Actual and potential protected areas with associated projects are:

   - **Korup National Park** (conservation and development);
   - **Waza National Park** (research and equipment for guards);
   - **Dja Wildlife Reserve** (conservation and development, planned);
   - **The western slope of Mt. Cameroon** (conservation);
   - **Kilum Mountain** (conservation and development); and,
   - **Mount Kupe** (conservation and development).

2. **International research and training programs** are operating through:

   - the University Centre of Dschang,
   - the Wildlife College at Garoua,
   - the National School of Waters and Forests at Mbalmayo, and
   - the Institute for Agricultural Research at Nkolbisson.

3. **Conservation education** is incorporated into the protected area projects and is also a theme of local Private Volunteer Organizations (PVOs).

4. **Natural lands management** is addressed by work on forest regeneration at Mbalmayo and by the extensive inventory and mapping project sponsored by the Canadian government through the Directorate of Forests.

Except for the programs of research, these activities are mostly less than 4 years old; their long-term social or environmental effects cannot yet be evaluated. Visible shorter-term social benefits include local employment, academic and vocational training, and probably small increases in income from tourism. Environmental benefits include local reductions in poaching and deforestation, which help maintain genetic diversity, water balance, and soil fertility. Each of the four areas is covered below.

8.4 PROTECTED AREAS MANAGEMENT AND ASSOCIATED RURAL DEVELOPMENT

8.4.1 Dja

The Wildlife Reserve of Dja is the site of a planned, pilot project of the EEC program, Conservation and Sustainable Use of Forested Ecosystems in Central Africa (Conservation et Utilisation Rationnelle des Ecosystèmes Forestiers en Afrique Centrale). GTZ, UNESCO, and IUCN may also be involved. A management plan was drawn up for Dja as early as 1987 (Bedel et al. 1987). Under the aegis of the EEC, Gartlan and Leakey (1988) outlined a project for Dja focused on village-level forest product use. The currently planned project is to revise the reserve boundaries, elevate Dja to national park status, and develop an infrastructure (Courtemanche 1991). The EEC has apparently not yet awarded a contract for the project (Michel Gauché , pers. comm.).

8.4.2 Korup

Korup National Park is currently the only Cameroonian national park with a management plan (Augustine Bokwe, pers. comm.). By agreement with the government of Cameroon, Korup is managed by World Wildlife Fund (WWF-UK and WWF-International). By agreement between WWF and Wildlife Conservation International (WCI, the international office of the New York Zoological Society), the WWF Korup Forest Project continues to have responsibility for overall park management and associated rural development, while the WCI Korup Forest Research Project has assumed responsibility for biological research, inventory, and training in the park. Some of the training has been carried out in conjunction with two local organizations, the Presbyterian Rural Training Center in Kumba and the Cameroon Opportunities in Industrialization Center in Buea. GTZ has recently implemented a third project near Korup, directed towards forestry around the park.

The WWF project receives partial funding from the British Overseas Development Administration, which also stations rural development workers in the area. The WCI project is primarily funded by USAID and has received the assistance of U. S. Peace Corps volunteers. Powell (1990, 1991) and Alpert (1991) detail the recent activities and current status of the WCI project. As of August 1991, the senior government representative and project leaders are Mr. Zachary Akun (Conservateur du Parc, DFPA), Dr. Andrew A. Allo (WWF), Mr. James A. ("Buddy") Powell (WCI), and Mr. Ekkehard Nolte (GTZ).

Korup has accumulated a fairly large set of geological, biological, and sociological studies (e.g., Synnott 1988; Reid 1989; Dejaifve 1991). These include lists of fish, birds, and bats; population studies of elephants, duikers, and certain primates; and surveys of soils and village demography and economics. Most of these studies are unpublished but available as reports to WWF or WCI. Copies of many of these are archived at the Korup park headquarters in Mundemba (pers. obs.). The extensive set of data on tree species

composition is available for measurement of change in species composition over time (pers. obs.). Another large set of data on trees may have been gathered by a graduate student from the University of Florida in the northern part of the park, but these data are not in Cameroon (James Powell, pers. comm.). Korup has also been the subject of studies using satellite image interpretation (e.g., Scurlock 1988). Results may be available at WWF-UK or Cambridge University in England (Clive Wicks, pers. comm.).

As the result of a proposal from the U.S. Embassy in Yaoundé , the U.S. Dept. of Defense has agreed to contribute $500,000 for the conservation of biodiversity at Korup (Kevin Kenny, pers. comm.). A potential use of the funds is to enable Cameroonian and American military engineers to improve village infrastructure around the park.

8.4.3 Kilum Mountain (Mt. Oku)

The Kilum Mountain Project (previously the "Mt. Oku Project"), is a conservation and development project led by the International Council for Bird Preservation (ICBP) and centered on a montane forest on the tallest mountain in the Bamenda Highlands. The project effectively began in January 1988, following a zoological survey in 1983, a second mission in 1985, and the preparation of a conservation plan in 1987 (Macleod 1987). As of 1989, the ICBP project leaders were John Parrot and Heather Macleod, and the project was receiving support from ODA and from WWF-US, possibly through the Wildlands and Human Needs program centrally funded by USAID (Stone 1989). Activities included boundary delimitation, management planning, promotion of sustainable farming and honey-gathering, a nursery for propagation of leguminous plants and native trees, and a newsletter, which is still being published (Christopher Bowden, pers. comm.).

The project is now led for ICBP by Simon and Val Tame and receives the assistance of an ODA officer, Jeff Bocket, who holds an M.Sc. in agronomy (Roger Corneille Fotso, pers. comm.). In 1989, the forest covered approximately 170 km^2, of which one-third was severely degraded; it had shrunk by about one-half since the mid-sixties (Stone 1989). The forest now covers less than 150 km^2 and contains three endangered species. The project has submitted a formal proposal to the government to classify Kilum as a protection forest (Christopher Bowden, pers. comm.).

8.4.4 Mount Kupe

Mount Kupe is the site of a new ICBP conservation and development project in the montane forest. The existing primary and older secondary forests on Mt. Kupe cover about 21 km^2. Primary forest starts at about 800-900 m on the west slope and 1100-1200 m on the east slope to the summit at 2064 m (ICBP 1991; Christopher Bowden, pers. comm.). The forest consists of premontane and montane evergreen forest, including a small area of Podocarpus (coniferous) forest near the summit.

Mount Kupe is rich in birds. Approximately 270 species have been sighted. Four are threatened, endemic birds of the montane forests of western Cameroon. Another, the Mt. Kupe bushshrike (Malaconotus gladiator) is found nowhere else. The bushshrike figures on a 70 FCFA Cameroonian postage stamp designed by Roger Fotso (pers. obs.). The forest also contains two threatened primates, the drill and the russet-eared guenon (Cercopithicus erythrotis). At least three fairly open but steep trails exist in the forest. One leads from the project house to the summit.

The forest has no effective legal protection. About 6 km^2 is a forest reserve, but this includes some of the more degraded areas. The summit ridge forms a boundary between two Cameroonian divisions, one Francophone and one Anglophone. In 1983-1984, Stuart (1986) found that the major threats to the forest were from agricultural encroachment and tree-cutting near the base of the mountain. Threats may have increased. The ICBP (1991) reported tree-felling up to 1600 m and metal snares and traps up to 1800 m. In 1988, 32 drill were apparently shot, representing approximately 10% of the remaining population. Pending discussion with local villagers, the project may seek protection forest status for the mountain (Christopher Bowden, pers. comm.).

During its first 5 months, the project has concentrated on gathering information on the attitudes, economy, social structure, land claims, and forest use by local villagers; and on the vegetation and animals of the mountain. Limitation of crop yields by disease appears to encourage expansion of croplands. The project may receive assistance in this regard from Nigel Price, an ODA worker on nematodes at Ekona. A habitat map of the mountain is about one-fourth complete (pers. obs.), and mist-netting of forest birds is conducted frequently.

During the next 6 months, the coordinators hope to meet with additional villages, begin a newsletter, and give slide shows about the forest. The project may be able tow work with several Nyasoso village organizations that the project may be able to work with. The Kupe Progressive Farmers' Club, a group of about 15, has itself sent members to the RTC courses in Kumba. The Bakosi paramount chief, Chief Ntoko, is from Nyasoso. In October, an American tourism group, Bird Bonanzas, is to include Mt. Kupe on a tour. Further details of progress and plans are contained in the 3-month project report to be submitted to the ICBP officer for Africa, Nonie Coulthard (pers. obs.).

8.4.5. The Extreme Southeast

The lowland evergreen forest of the extreme southeast has been the site of several proposals for reserves and national parks. Harrison and Agland (1987) proposed a set of three parks. These may be the areas now under consideration for wildlife reserve status: Lake Lobeke, Boumba Bek, and Nki. World Wide Fund for Nature Cameroon and WCI (1991; Section 7.3) have requested USAID/Cameroon funding for a project that would link the integrated conservation and development of the region with that of similar projects in

adjacent portion of C.A.R. and Congo. The ensemble of actual and potential parks and reserves in the three countries is sometime referred to as a Tri-National Park.

The World Bank is identifying potential projects that could involve protected areas in the extreme southeast. The Bank has no operational projects in the forest sector in Cameroon (Helène Pieume, pers. comm.). However, during the last 2 years the Bank has considered versions of a proposed project on forestry, wildlife preserves, and national parks (e.g., World Bank 1990, 1991). One recent version, entitled the West African Tropical Forest Project, is proposed for funding of about US$10,000,000 by the Global Environmental Facility (GEF) in association with a proposed Forestry and Environment Project. An undated project brief from the Bank indicates that this tropical forest project could support protected area management in the coastal evergreen and semi-deciduous humid dense forests. The brief cites three apparent preconditions for the project. The GRC is to:

- grant formal national park status to the three forests in the southeast associated with the proposal for a Tri-National Park,
- defer any commercial forest exploitation of 50,000 km^2 in the southeast until a dense forest use plan has been developed, and
- assess environmental impacts before developing the project area.

In a letter, the Environmental Defense Fund questioned whether this grant will have a negative impact on conservation, given present land tenure policies, plans to exploit primary forests, and conflicting propositions to the Bank and to other donors for forest exploitation and road construction.

WCI recently sponsored a series of biological surveys of the extreme southwest (Stromayer and Ekobo 1991) as well as a socio-economic survey (Bill Weber, pers. comm.). The biological surveys (conducted October 1990 to May 1991) included the proposed reserves of Lake Lobeke and Boumba Bek, plus the area east of Lake Lobeke to the Sangha River and the area southeast of Lake Lobeke to the corner of Cameroon (their Mongokele site). These surveys confirmed reports of exceptionally high densities of forest elephants, western lowland gorillas, and bongos (Tragelaphus euryceros). Stromayer and Ekobo (1991) noted that Boumba Bek was virtually undisturbed by human activity, that 400 km^2 in the proposed Lake Lobeke reserve was also apparently unlogged, that 85% of the region east of Lake Lobeke had been logged within the past 30 years or was presently in logging concessions, and that all of the Mongokele area had been recently logged. **They concluded that the entire area deserved protected area status.**

8.4.5 Waza National Park

Since 1984, the University of Leyden in Belgium, the IRZ, and the Wildlife School at Garoua have collaborated on ecological and sociological research in and around Waza National Park (Eils and Ekobo [no date]; Noordzij 1988). From 1984 until 1990, this research came under a program entitled, "Sustainable use and protection of the environment in the plain of the Logone and the development of the biosphere reserves of Waza in north Cameroon." The three research themes were vegetation, fauna, and human populations.

In August 1991, the U. S. Fish and Wildlife Service and Pectin Oil Company of Houston agreed to contribute $75,000 and $15,000 (respectively) for equipment for an anti-poaching unit in Waza National Park (Tibor Hagy, pers. comm.). This was requested in a cable sent from the U.S. Embassy in Yaounde in November 1990, "Proposed FY91 African elephant conservation project -- Cameroon" (Yaoundé 9340). The cable proposed to supply park personnel with a vehicle, trail bikes, a radio system, camping equipment, and uniforms. Badjoda Daouda, the Conservateur du Parc of Waza, was suggested as liaison.

8.4.6 Limbe and Mount Cameroon

The Botanic Gardens at Limbe are the site of a conservation project funded by ODA that also includes the establishment of two forest reserves, one on the coast and one on Mt. Cameroon (Joe Watts, pers. comm.). The Royal Botanic Gardens at Kew approached ODA in 1985-1986 with an idea for renovation of the Limbe Gardens, the only botanic gardens in Cameroon. Two missions in 1986-1987 assessed the idea and linked it to in situ forest conservation. An agreement between ODA and MINAGRI was signed in January 1988; the Limbe Botanic Garden and Rainforest Genetic Project was begun in June 1988, with the arrival of the British coordinator for the garden portion of the project, Mark Bovey.

Originally, all in-country costs were to be paid by the Cameroon government. When no contribution was forthcoming, the project nearly came to a halt in December 1991. ODA exceptionally agreed to fund the entire project, which now has a total budget of 0.5-1.0 million British pounds for a 5-year period (ending June 1993). Other staff include Nouhou Ndam, the conservator of the gardens and counterpart of Mr. Bovey; Joe Watts, the British coordinator for the forest reserves portion of the program, and who replaced the original forester in January 1990; Guillaume Akogo Mvogo, senior forest officer under the Directorate of Forests and counterpart of Mr. Watts; and Martin Nganje, the education officer. Both British coordinators are technical cooperation officers by contract to ODA. The project is under the Directorate of Forests, where Joseph Besong is the main contact in Yaoundé . The main contact at Kew is Martin Cheek, and was Nigel Heper. Facilities at the garden include a small herbarium, a set of garden buildings, and about 50 ha of land.

8.5 TRAINING AND RESEARCH

FAC supports research at IRA in Nkolbisson and Maroua, and training of forestry engineers at the University Centre of Dschang/INADER, in collaboration with several French schools. FAC is considering proposals for a school of advanced forestry in the dense forest zone (Courtemanche 1991).

The National School of Water and Forests (ENEF, L'Ecole National des Eaux et Forêts) at Mbalmayo currently receives support from the U.S.S.R. (Courtemanche 1991). ENEF offers training up to the level of technician supérieur forestier, equivalent to 2 years beyond the French baccalauréate (Andrew Roby, pers. comm.).

Belgium is providing funding for the Wildlife School at Garoua, and the University of Leyden is helping establish a Centre de Recherche en Environnement et Développement at the satellite campus of the University Centre of Dschang in Maroua (Courtemanche 1991). The Belgian government has awarded a scholarship for 2 years, beginning October 1991, to a Cameroonian, Roger Fotso, to complete a Ph.D. on the relationship between biodiversity of birds and forest degradation and succession near Yaoundé (Roger Fotso, pers. comm.).

8.6 CONSERVATION EDUCATION

World Wide Fund for Nature Cameroon plans to hire Manasseh Ngome, a linguist who teaches at the National University of Yaoundé , as an education officer (Manasseh Ngome, pers. comm.). Conservation education is a component of most current conservation and development projects. For example, the WWF and WCI projects at Korup each have an education officer and have produced a number of educational pamphlets for adults and for children, and a play about forest conservation (Andrew Enyang and Daniel Agoons, pers. comm.; pers. obs.). Education is also a major theme of indigenous PVOs.

8.7 NATURAL LANDS MANAGEMENT

8.7.1 Inventory and Land-Use Planning

The Canadian aid program to Cameroon has led the way in forest inventory (Poirier and Ménard 1984; Cabana 1988a,b; Desloges 1990, Durand 1990, Guimond 1991). Currently the Canadians are working with the Direction des Forêts (CIDA/ONADEF) to improve their land-use planning capability by conducting a reconnaissance survey for the southern part of the moist forest zone. Their objectives are to keep the population stationary and to protect the soils. Human population density, topography, accessibility,

geology, soils, and vegetation are discriminatory factors used. The scale of mapping is small (1:200,000).

Largely through its program, Appui Institutionnel Forestier, CIDA has funded four major efforts:

1. aerial photography of the forest zone;

2. satellite mapping of the entire country;

3. ground forest inventories of the forest zone; and

4. forest land-use plans.

Collaborators include the Direction des Forêts, ONADEF, the Centre de Coopération Cameroun Canada (CCCC), and Poulin Thériault Ltée of Québec. As of August 1991, persons involved include Denis Buteau, Denis Durand, Charles Morissette and Sylvie Côté from CIDA/Poulin Thériault at the headquarters of the Direction des Forêts in Yaoundé; and Yves Brousseau and Raymond Mainguy from CIDA at the Laboratoire Photo-Carto at ONADEF in Nkolbisson. Pierre Courtemanche, technical forestry advisor, had left the CCCC to assume a similar post in Zaïre.

After spending about $30,000,000 over 10 years (Pierre Courtemanche, pers. comm.), a variety of items have been produced:

- a manual of forest trees (Thirakul 1983), of savanna trees (Thirakul 1990), and of photointerpretation (Gauthier 1988);

- proposals for land-use plans (Cabana 1988c; Cossette 1988; Tremblay and Ngong 1989) and for national standards for forest inventory (Cameroon/ONADEF 1991);

- a list of local and scientific names for trees of commercial interest (Ahanda 1991);

- detailed stand inventories of commercial timber species (Cabana 1988b) and vegetation maps (Cabana 1988a) for the southern part of the forest zone;

- aerial photographic coverage of over one-half of the forest zone, with no additional photography planned (Guimond 1991; Raymond Mainguy, pers. comm.);

- a collection of 25-26 of the 28 Landsat images required to cover all of Cameroon, in the form of negatives composited from bands 3, 4, and 5 of

1985-1987 Landsat TM data (Raymond Mainguy, pers. comm.; pers. obs.) [those missing are for the forest zone]; and

- a custom software program for analysis of forest inventory data, written in Quickbasic and under revision by Alan Renaud (Yves Brousseau, pers. comm.).

A Cameroonian, Mr. Djoda, is now training in satellite image interpretation at the University of Sherbrook in Québec. Immediate plans are to continue forest timber inventories in the northern half of the forest zone and to collect ground data for interpretation of Landsat images in the savanna zone (Raymond Mainguy, pers. comm.). CIDA has also run a program of support to small forest enterprises (PME, Petites et Moyennes Entreprises; Kutzler & Associates 1989).

The Africa Bureau of USAID has initiated a Central Africa Global Change Project that includes natural lands inventory in Cameroon. The first phase of the project is intended to produce an action plan. This phase has three components, satellite mapping of forest extent, on-site verification of mapping, and background study of the context for sustainable forest use. The satellite map will be prepared in collaboration with the Goddard Space Flight Center of NASA. Map accuracy will be checked against data on vegetation and land use collected by NGOs in the region. The initial test of a protocol for field data collection has begun in eastern Zaire in cooperation with WCI. Further tests may take place in collaboration with the Korup Forest Research Project in Cameroon and the Dzanga-Sangha Conservation Project in C.A.R.

The first phase of this project will last from March 1991 through April 1992. It is managed by the Biodiversity Support Program, a consortium of the WWF, The Nature Conservancy, and the World Resources Institute. The Biodiversity Support Program receives core funding from the Science and Technology Bureau of USAID. Specific funding and guidance for the Central Africa Global Change Project are provided to the Program by the Agriculture and Natural Resources Division of the Africa Bureau (AID/ AFR/TR/ANR) through its Natural Resources Management Support Project (NRMS). In Cameroon, work could be coordinated with CIDA and ONADEF.

8.7.2 Mbalmayo

The Mbalmayo Forest Reserve about 50 km south of Yaoundé is the site of forestry or agroforestry stations of ODA/ONADEF, IRA, and IITA. This summer, ODA initiated a Forest Management and Regeneration Project (FMRP) with funding of up to 2,100,000 British pounds over an initial period of 3 years (c.f. a project newsletter). The project includes vegetative propagation (bouturage) of four species of native trees, comparison of five forest regeneration treatments, and on-site planking of experimental trees with a portable sawmill. The project intends to scale up to commercial levels some studies begun in 1987 on nutrient cycling, mycorrhizae, forest regeneration, and tree breeding (Tropenbos

1991; project staff, pers. comm.). Their clonal research has improved production (growth of young trees) by 31, with simple techniques.

Project staff include Andrew J. Roby, project coordinator and silviculture technical cooperation officer (TCO) from the Natural Resources Institute (NRI) in Britain; Dr. Gerry Lawson from the Institute of Terrestrial Ecology of the British National Natural Research Council; and Drs. Zac Tchoundjeu and Paulinus Ngeh of ONADEF. The project addresses conservation indirectly but substantially by attempting to increase the supply of indigenous timber species from previous logged areas.

IITA is studying the dynamics of land regeneration during fallow periods (Courtemanche 1991). Through a two-year Rockefeller postdoctoral grant and in association with IITA, Dr. Diane Russell is studying farming practices in four villages around the forest (Diane Russell, pers. comm.).

8.7.3 Other

Tropenbos, a Dutch organization, is to establish a program centered in a timber concession operated by the Wijma-Cameroon company about 50 km east of Kribi in the lowland evergreen forest (littoral subtype) (Tropenbos 1991). The program is to focus on sustainable timber production in natural forest. A team of five Dutch scientists and five Cameroon counterparts will plan a set of research projects that will form the nucleus of the program. The first phase will consist of an ecological forest survey and an appraisal survey to design the second phase. Among the many subjects to be addressed are: biodiversity; land use planning; land tenure; sustainable management; education and training (Tropenbos, 1991). The program is to be implemented mainly by IRA and by Wageningen Agricultural University, the Netherlands, and to operate under the authority of the Direction des Forêts.

Among other agencies (Courtemanche 1991), FAC is considering a proposal for a pilot project in integrated forest management at Dimako and Mbamy. OIBT is planning to develop a forest soil use plan for the Southeast, and pilot projects in management of the forest reserve of Sud-Bakundu and the forest of So'oala. UNSO is helping MINPAT develop a land use scheme for the north of Cameroon. Five other forestry projects are in the identification stage at the World Bank. The Bank has finished a project of support to ONAREF (now part of ONADEF) for reforestation, but apparently without achieving the objectives of the project (Courtemanche 1991).

Two CARE projects, Projet SOS Louti-Nord and Projet Agroforestier-Mokolo, are addressing the need for soil and water conservation, improved agricultural production, and rational management of wood resources in the northern part of the country. This is a new project and does not yet have successful NRM interventions that can be replicated in other parts of Cameroon.

Projet Centre Nord is a collaborative project between French CIRAD and IRA's Centre de Récherches Forestières with initial funding by the World Bank and additional funding through FAC and CCCE. This project will end in 1994 and another donor has not been identified to continue the work.

ORSTOM is planning to survey selected 25 km^2 areas throughout the country. These surveys will map and document numerous aspects relevant to land-use and will be used as ground-truthing sites for satellite-image data.

Projet d'Aménagement Pilote Intégré (API) is a proposed project that will be executed in the deciduous forest of southeast Cameroon. Subjects to be studied include:

- Forest growth performance about thirty years after logging;
- Timber exploitation, management and silviculture;
- Satisfying the needs of local people with regard to agricultural land and forest products;
- Participation of local people in land a resource management;
- Intensive agroforestry as an alternative to shifting cultivation; and
- Ecological aspects (Tropenbos, 1991).

8.8 CURRENT US/AID SUPPORT OF CONSERVATION OF BIODIVERSITY AND TROPICAL FORESTS

8.8.1 Scope

Current USAID support of biodiversity and tropical forests is not a prominent part of Mission strategy. The conservation of biodiversity and tropical forests does not figure in the mission strategy and portfolio as a primary component. The current USAID/ Cameroon action plan defines natural resources/biodiversity as a sector of activity and calls for more attention to natural resources/biodiversity management through policy dialogue and possible recruitment of a natural resources officer (USAID/Cameroon 1990b). An earlier Mission document on natural resources strategy suggested that USAID contribute to natural resource management by facilitating planning and coordination in the forestry sector (USAID/Cameroon 1990a).

The Mission's Target of Opportunity 4.3 ("Management plan for utilization yet protection of unique biodiversity of Korup National Park developed and adopted by GRC") focused on Lake Nyos and the agroforestry activities of CARE address natural resource

management, but not necessarily conservation of biodiversity or tropical forests. Natural resource management is not among the three strategic objectives of the Mission (USAID/ Cameroon 1990b), and the Mission does not at present have any staff dedicated solely to natural resource management. Compared to other donors, USAID instead focuses on agriculture (USAID/Cameroon 1990b).

No currently funded project of the Mission is primarily directed towards conservation of biodiversity or tropical forests. USAID/Cameroon has contributed directly to the conservation of biodiversity and tropical forests through support for the Korup Forest Research Project and support for postgraduate training in biology in association with the University Centre of Dschang. Other projects directed at increase in agricultural yield may have contributed indirectly to conservation by reducing demand for additional cropland, but this effect has not been measured. The most recent activity and special interest coding of USAID/Cameroon projects (provided by the Mission in its FY 1993 Annual Budget Submission (ABS) (U.S. Agency for International Development/Cameroon 1991)), shows that for FY 1992 no percentage of any currently funded project is attributed to either of the special interest codes specifically related to biodiversity or tropical forests (i.e. NFM (natural forest management) and BDV (biodiversity)).

8.8.2 Direct Interventions

Nevertheless, the Mission portfolio contains several relevant conservation interventions. These include:

- one past buy-in directed entirely towards the conservation of biodiversity or tropical forests,
- one present project directed in part towards their conservation
- two or three additional present projects that may contribute to conservation indirectly,
- one present project that may contribute directly in the near future, and
- one future project that could be primarily directed towards conservation if so designed by the Mission (Table 8-1).[2]

The Mission has partially funded one activity specifically directed towards the conservation of biodiversity or tropical forests through protected area management (USAID/Cameroon 1989). It did so through a buy-in to the Natural Resources Management Support project (698-0467) of the Africa Bureau for the sub-project, Natural Resources Management: Biological Inventory and Training in Korup National Park (698-0467.31; Weber 1987). The amount of the buy-in may have been about US$ 300,000; it does not appear in any Mission

---

[2]As discussed in the Cameroon Country Development Strategy Statement (CDSS) for 1991-1994 (U.S. Agency for International Development/Cameroon 1989).

ABS but may have come from the FY 1988 budget (Ellsworth Amundson, pers. comm.). This amount is probably about one-half of the total funding from USAID for the project (James Powell, pers. comm.). The Mission continues to support the **Korup Forest Research Project** by providing radio communication to the project headquarters at Nguti and the use of Mission facilities to project staff during their occasional visits to Yaoundé.

As of FY 1991, one currently funded mission project, the **Agricultural Education project** (631-0031), has a component likely to contribute directly to biodiversity or tropical forest conservation through training and research. The project financially supports Cameroon study for advanced degrees at various U.S. universities. Most degrees are in agricultural disciplines, but a number have been in subjects more directly related to the conservation of biodiversity or tropical forests. According to the most recent list from Mission files (November 1989), the directly relevant degrees have been a M.Sc. in wildlife ecology, a M.Sc. in pedology and conservation of forest soils, and a Ph.D. (expected in 1990) in systematic botany. Potentially related degrees have been M.Sc. in forestry (3), forest management (1), biometry (1); and a Ph.D. in soil science.

8.8.3 Indirect Contributions

Two Mission-funded agricultural projects may contribute indirectly to conservation (Table 8-1). The **National Cereals Research and Extension project** (NCRE; 631-0052) is designed to increase agricultural productivity by providing improved varieties and methods of growing maize, rice, sorghum, and millet; the **Tropical Root and Tuber Research project** (ROTREP; 631-0058) is similarly aimed at cassava, yam, cocoyam, and sweet potato. NCRE and ROTREP do not involve any wild plant varieties from Cameroon; thus, they do not contribute directly to the conservation of natural biodiversity in Cameroon (Acquah 1991; ROTREP 1991). However, they might contribute indirectly by reducing economic pressures on natural lands (USAID/Cameroon 1990b).

Contributions, however, remain to be measured. Such potential indirect contribution of crop and farming improvements to the conservation of biodiversity or tropical forests remains to be tested. To the extent that any resulting productivity increases existing cropland or increases forest plantings, the clearing of natural vegetation for new cropland may be reduced. These projects will help conserve biodiversity. To the extent that they reduce clearing of forests, they will conserve tropical forests. However, if agriculture is made more attractive through increased productivity, forest clearing might increase, particularly on agriculturally marginal lands, which are more likely to have retained natural vegetation (Cabana 1988a).

NCRE may have begun to incorporate additional, indirect contributions to conservation through agroforestry, but verification would require more detailed evaluation and monitoring. The most recent briefing paper submitted by the project (NCRE Project 1991) notes only that some agroforestry systems were tested on farms during 1986-1990 by

the Testing and Liaison Unit at Nkolbisson. The FY 1992 ABS, using a old coding system[3], attributed 30% of the requested NCRE budget for FY 1992 to environmental management, planning, and policy, 5% to soils, and 5% to water resources management. Of this total of 40%, 10% was considered to fall under the special interest, natural resources management. NCRE appears to be the only currently funded project attributed for FY 1992 to any component of natural resources (i.e., the equivalents of the present codes for the energy/environment sector, which are EVFR (forestry) and EVMP (environmental management, planning, and policy)).

Other current agricultural or economic Mission projects may increase indirect support. The **Fertilizer Sub-Sector Reform project** (FSSR; 631-0053) seeks to increase the use of chemical fertilizers. As the CDSS notes, this could have either positive or negative indirect effects on biodiversity or tropical forests. The **North Cameroon Seed Multiplication project** (631-0023) is designed to increase the supplies of seeds of agricultural varieties, but not necessarily to improve potential productivity per unit of cropland. It is not obviously linked to biodiversity or tropical forests.

8.8.4 Planned Contributions

The immediate future of mission activity in the areas of biodiversity and tropical forest conservation thus seems to depend upon the design of the Natural Resources Management project (NRM; 631-0081) and, to a lesser extent, upon the redesign of NCRE. For FY 1992, the FY 1993 ABS attributes $650,000, or 2.7% of the total mission budget, to biodiversity or natural forest management. This attribution, contained within NRM, constitutes 65% of the planned budget of the project for the year.

The new project narrative for NRM contained in the FY 1993 ABS defines the scope of the project and leaves its specific design open. The scope covers policy and institutional reforms and technical interventions in the areas of biodiversity, vegetative cover, and soil fertility and erosion. The design is to follow from a natural resources strategy to be developed by the Mission, partly on the basis of the present assessment. Funding for the life of the project is US$ 5,000,000, from the DFA.

For FY 1993, a slightly larger proportion of the Mission budget, 3.0%, is attributed to biodiversity or natural forest management. The increase is based on a new contribution to natural forest management from NCRE in 1993; planned contributions to biodiversity and natural forest management from NRM are the same in FY 1992 and 1993. The anticipated contribution from NCRE, which equals 15% of the requested project budget for the year, probably reflects a planned increase in emphasis on agroforestry (NCRE 1991).

---

[3]NCRE was not coded for 1992 in the latest ABS.

8.8.5 Future Opportunities for USAID

The Mission has two main avenues of opportunity for future contribution to the conservation of biodiversity and tropical forests in Cameroon.

1. **First, the current portfolio can be maintained** through renewed support for inventory and training at Korup National Park and continued funding for biological degrees at Dschang.

   The portfolio could also be strengthened by more direct association of two agricultural and potential agroforestry projects, NCRE and ROTREP, with protected area projects at Kilum, Korup, Kupe, and Limbe in the western mountain forest and southwestern lowland and evergreen forest.

2. **Second, the planned Natural Resources Management project can be used to fund new activities.** The moderate budget of the project, the extensive investment of the Canadian government in the forestry sector, the uncertainty currently attached to potential policy reforms, the relative expertise of USAID in the agricultural sector, and the limited support now available for direct conservation of biodiversity and tropical forests in Cameroon all suggest that funding might be most effectively used to support one or two integrated conservation and development projects associated with protected areas. The ideal project might gather an indigenous PVO for conservation education, an international conservation organization for park management and inventory, and a U.S.-funded development organization for rural development.

   Unfortunately, no ideal project has been proposed. The Mission has before it one proposal for integrated conservation and development, in the extreme southwest. It appears to be the consensus of the Mission that the proposal is worthwhile, though it could profit from revision. Cooperative design of this or a different project might help tailor it to Mission objectives and minimize future Mission management requirements.

Options:

- The Mission could consider funding IITA to continue NCRE at a reduced level. The National Cereals Research and Extension Project (NCRE; 631-0052) is beginning its third and probably last phase. Having successfully improved the production capability of several cereal crops, it has moved to focus on techniques associated with sustainable agriculture (e.g., agroforestry and alley cropping). However, project personnel doubt that agroforestry techniques that significantly improve crop production can be developed quickly.

The issue of agricultural sustainability should also consider institutional sustainability and the closure of this project so that research results and the institutional building that has occurred are not lost. Funding IITA to continue the program with a much reduced expatriate staff is an option that could provide a smooth low-cost transition into a more sustainable organizational structure of IRA.

- USAID should consider funding research at IRA and the University Center of Dschang more directly by following a grant system similar to that used in US universities. USAID could fund solicited or received proposals from private, governmental, or donor client researchers directly, with a negotiated percentage of the grant going to the host institution. The funding mechanism could significantly supplement the income of good researchers, thereby providing incentive to attract bright young students into research. So long as the researchers do acceptable work, they will continue to receive funding for more and larger projects. This mechanism will direct research toward needed activities; it will also allow competent manager/ researchers to direct more efficiently the activities of less skilled colleagues through formal or informal subcontracts.

- Action could focus on extending ROTREP research to practical applications for functioning businesses. The Tropical Root and Tuber Research Project (ROTREP; 631-0058) has greatly improved root and tuber propagation techniques with methods possible for small business in Cameroon to replicate. Extending this technology from research into functioning businesses will allow farmers to increase food production without expanding cultivated area, thereby contributing directly to the Development Fund for Africa's strategic objective three.

- Improvements in distributing fertilizer through retail agents could be supported. The Fertilizer Sub-Sector Reform Project (FSSR; 631-0053) has succeeded in improving the distribution of chemical fertilizers. However, more fertilizer is needed than can be supplied, especially for maize growers. Fertilizer distribution could be improved by including retailers in the sale of fertilizer which would increase its availability and could better provide more convenient packaging (Baker, 1991).