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**Burkina Faso  
Natural  
Resources  
Management  
Action Plan**

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## **PREFACE**

This report was prepared by a team of five. Chapters One and Two were written by John Heermans and Robert Winterbottom, Chapter Three by Mike McGahuey, Chapter Four by Anthony Johnson, and Chapter Five and the Executive Summary by the team leader, Harvel Sebastian. The field work was done during October and November 1990.

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## EXECUTIVE SUMMARY

This is a concept paper. It presents a set of concepts bearing on the management of natural resources in the project area. The paper sets these against the institutional and anthropological realities to be found there, and suggests points of intersection between the two that require accommodation. Each set of concepts in this paper comes with recommendations and discussion for their possible implementation in an eventual National Resources Management (NRM) Project. This paper thus provides A.I.D., the Mission, and NRM Contractors with a menu from which to select elements for the construction of a project.

It should be understood that the authors of this paper are not attempting to present one agreed view of how the NRM project should be oriented, but two possible frames of reference and orientation. Thus the recommendations in this summary have been organized into two divergent approaches inherent in the proposed sets of concepts. Many of these concepts are common to both approaches, but the activities of the ensuing projects would be differently defined and weighted. The Mission, and project design teams, will have to make choices, but we believe the choices will be elucidated and informed by what we offer here.

### TWO POSSIBLE APPROACHES FOR RESOURCE MANAGEMENT

A guiding concept for both approaches is that USAID should continue active support for CILSS (Comité International pour la Lutte contre la Secheresse au Sahel), CEAO (Communauté Economique de l'Afrique de l'Ouest), and CEBV (Communauté Economique de Boeuf et de Viande), as well as policy dialogue between Sahelian countries to develop and pursue strategies for antidesertification.

#### APPROACH ONE

**CONCEPTS: FRAME 1.** The focus is conservation in two selected project areas. It calls for protective economic development of resources (mostly forest, interstitial land, and wildlife) to permit sustainable use and some reinvestment. Endangered and disappearing resources are the immediate target, and first efforts constitute a crisis response. Subsequent development focus is on agriculture, farming systems, and generalized economic development of local rural communities. Recuperating/sustaining soil fertility, water-control/harvesting, and agroforestry then become priorities. This ordering of priorities bears on both policy and implementation.

#### Operational Concepts

1. Provide *Schéma Directeur* (Master Plan) for woodland within 100-km radius of Bobo Dioulasso. This plan will include a macro land use plan, mapping, and identification of optional areas for agriculture, pasture, forestry, and wildlife parks.

2. **Inventory forest and firewood situation. Prioritize forests according to potential, access, size, density, roads, tenure problems, participatory effort of villagers, encroachment of settlers, poachers, harvesters, and so forth.**
  - 2.1 **Recommend future status and permitted patterns of settlement.**
  - 2.2 **Study forest-product markets. Control of firewood production and marketing reverts to the village. Integrate fuelwood management with planning and control of other forest products such as honey, karite, and medicinal plants. Use these to diversify, raise rural incomes, and reinvest in resource management. Consider markets for other wood products such as sawtimber, parquet, biomass-fired generators for power production. Do feasibility studies.<sup>1</sup>**
  - 2.3 **Favor forest and fuelwood management over subsidized increases in reliance on imported hydrocarbons for domestic energy source.**
3. **Protect wildlife through managed game-ranching and hunting. Use the computer model of ADEFA (Association pour le Développement de l'Exploitation de la Faune Aménagée) to study economic feasibility and project area resources.**
4. **Integrate sustainable practices into village zoning and land use plans.**
  - 4.1 **Use agroforestry, conservation practices, and integration of livestock management to restore soils fertility and promote sustainable agriculture, fostering intensive and cooperative use of pasture within village *terroirs*.**
  - 4.2 **Working with the ARTS project (USAID's Agriculture Research and Training Project), foster development and use of technical packages to enhance agricultural productivity and sustainability.**
  - 4.3 **Catalyze collaboration between MET, MAE, MACP, INERA, and IRBET, for example, to improve management of noncultivated lands, thereby diversifying local rural economy.**
5. **Conserve and improve management of Comoe-Leraba forest reserves in region southwest of Banfora. Stabilize land use in adjacent areas, and provide for rational use of area natural resources. Support Government of Burkina Faso (GOBF) efforts to control immigration and poaching in project areas.**
  - 5.1 **Forestall further settlement and land clearing within the Comoe Leraba forest reserves through planned multiuse management, improved surveillance, and training and education.**
  - 5.2 **Develop training curriculae and materials to train trainers (MET, MAE) in game-ranching, and appropriate forest and range management. Provide logistic support to permit on-site training and demonstrations.**
  - 5.3 **Strengthen the Ministry of Environment to halt conversion of forests and reserves to other uses.**

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<sup>1</sup> Use experience of Winrock Inc. in the Biomass Energy Systems Technical Project.



- 5.4 Develop a management plan for silvicultural regulation. This includes authority to cut live trees.
- 5.5 Develop a congruent livestock-management and nomadic-herder support plan for forest areas. Consider project activity in any of the 44 potential dedicated pastoral zone sites identified by GOBF. This should involve range improvement, water-point controls, forage species testing and fodder crops, grazing contracts, veterinary services, village dispensaries and literacy classes. **Since nomadic herders and their animals are present in large and increasing numbers in the southwest, realistic environmental protection should include them in planning, remembering that the mobility of herds remains the herders' most vital strategy under circumstances of drought, and uncertain climate, water, and vegetation.**
- 5.6 Investigate reportedly heavy tze-tze infestation and trypanosomiasis in Diefola and Dida Forest areas.
- 6. Working within the framework of the Programme National de Gestions des Terroirs Villageois (PNGTV), support development of village-based rural cooperatives to develop and expand village-based management of national resources.
  - 6.1 Using nongovernmental organization (NGO) methods and management, such as that used by CLUSA (the Cooperative League of the USA/National Cooperative Business Association), train villagers to create management committees and cooperatives to function in NRM efforts and enterprises. Include technical assistance, and access to credit for infrastructure development and recurrent costs.
- 7. Increase incentives for improved NRM at village level, by supporting resolution of land tenure issues, and devolution of authority to an appropriate village group. Decentralize authority over local resources.

## APPROACH TWO

**CONCEPTS: FRAME 2.** The focus is production for improved yield and income through broad-based activities centered on the PNGTV test villages, with first emphasis on achieving food sufficiency goals, but with all activities and technology oriented and informed by best natural resource conservation approaches. This is not a salvage approach to sectoral crisis, but a process building toward sustainable systems. This approach is gradualist, really geared to the mid- or long-term result, and its development goal is a permanent change in knowledge, technology, and practices. It is focussed on and in the *terroir*, and aims to bring enlightened authority and management at the local level to bear on the problems of encroaching desertification.

### Guiding Concepts:

- 1. Define *terroir* boundaries, and zone for land use, then plan and manage growth in the *terroir* to reverse erosion and enhance productivity.
- 2. Do not lose time and the natural resource base waiting for *deus ex machina* supertechnologies, but attack all facets concurrently within what budget resources permit.

3. Reinvest increases in productivity thus achieved in the *terroir*.
4. Seek sustainable increase in agricultural products — food, wood, forage, and other — through improved management of soils, moisture, vegetation cover, germin plasm, and habitat. Stabilize and intensify crop production areas, and foster economic diversification in agriculture, forestry and livestock production.
5. Provide local-level project participants with enhanced incentives to reinvest in NRM through:
  - Guaranteeing use rights by supporting relevant legislation and contract;
  - Assuring wider access to knowledge, credits, and markets; and
  - Dissemination of successful technologies through coordination with other programs and projects, and information from other Sahelian areas.
6. Underlying assumption: Villagers, farmers, herders, woodcutters will all need to adopt changes in current practices if the land and primary resources base is not to be lost. This will only be possible when people at the local level become the actors and managers, instead of the "acted upon."

#### **Operational Concepts:**

This approach is an integrated and concomitant set of activities covering forest resource protection and development, soil and water antierosive action, soil fertility efforts, crop diversification, livestock management and integration in farming systems, small-enterprise generation, community organization, and training. Community action components include:

1. Conserve soils through manuring, rotation, compost pits, agroforestry, grass-strips, and erosion/water controls such as dams, small dams, and water-infiltration ditches.
2. Arrange access to credit, and train in literacy and accounting skills to permit local people to manage business.
3. Develop small enterprises based on any local resource that can be made profitable. Develop access to markets by creating them, and developing roads and transportation systems.
4. Secure land tenure and land use rights, and rights to earned benefits to rural residents through appropriate legislation and administration. The NRM project should provide analysis and technical assistance for land tenure problems through the Land Tenure Center. NGO training and guidance should support villagers to negotiate successfully with government, and develop appropriate contractual relations.
5. Provide local people information, access, and training in conservation-oriented appropriate technology through literacy, visits, example, research and extension. (Examples: animal traction, new and different cash crops, and improved cultivars.)

6. **Develop and organize human resources by integrating all community strata into decision-making groups, actions and benefits.** Project staff and counterparts will need to study each village's human ecology, target each group according to its own patterns of activity, and tailor extension packages flexibly to local realities.
7. **Manage land use conflict through zoning and realistic land use plans that include all users, and recognize roles, actions, and right to benefits of each component.** Emphasize the necessity to communicate, and inform and bring each social element into active collaboration.
8. **Manage livestock program at the *terroir* level.** Inventory, analyze and plan range and forest herd-carrying capacity, improve vegetation, use animals for traction, integrate animals with agriculture, improve cattle breeds (zebu to n'Dama, to Mere) for health and disease resistance.
9. **Establish two-way dialogue between research (INERA/IRBET/ARTS project) and extension programs at the *terroir* level.**
10. **Deliberately plan in three time frames, for short-, medium-, and long-term results.** Underlying assumption is that nothing else can be accomplished until food security is assured.

## RECOMMENDATIONS

What follows is a set of recommendations for essential questions the PID/PP teams will need to address, and the choices they will confront in solving NRM project design problems.

1. **FOCUS:** The project could adopt either a highly focussed, forest-resource "salvage" approach, or establish broad-based, conservation-oriented integrated rural development within the PNGTV package. In the former, the project would first seek to protect immediately endangered resources, which may be irreparably lost if not safeguarded. In the latter it would work across the board to gradually establish sustainable systems. In either case, it should probably expect to work within the PNGTV frame. Although many of the methods are the same, the shape of the project and its priorities would be different.
2. **SCOPE:** Geographic locus for the project will need to be defined, as well as magnitudes. Will project action be confined to the 100 km around Bobo Dioulasso in Houet, and the specific forests of Dida/Diefoula in the Comoe Leraba basin? Or should the project work broadly throughout region nine in Comoe, Houet and Kenedougou? Will the project, at least in the short term (first five years), work intensively in the carefully selected limited target area? Or should it serve as a resource bank of available expertise, program, and funding that may be tapped by local communities that wish to buy in, thus self-selecting for conservation and bootstrap operations? In the latter case, particularly, information and recruitment become major design elements. How many villages can the project expect to touch, and in which part of the (20-year) time frame?
3. **SELECTION CRITERIA:** Village selection criteria is a sensitive point, given the level of attack upon the environment, and the need to produce visible results to catalyze further action rapidly. Will the choice of solicited villages be based only on proximity to important endangered resources? Should villages where land management committees have already been established be advantaged? Should the project work first in existing PNGTV test communities, thus developing "show-case" models from which NRM practices can be disseminated? Or should "hard-case" villages, with mixed

and unintegrated indigenous and migrant members, and a history of disastrous land exploitation be the logical project target, to reverse trends and recuperate losses? Or is a "laboratory" approach within the target area, using a random selection grid, advantageous for the range of what can be learned from each individual community experience for future resource protection?

4. **CONTEXT:** In the context of second-phase PNGTV, with other donor-sponsored projects in the area, and a set of GOBF institutions and plans with which to work, the USAID NRM project must have defined relationships and working interactions.

We propose an organizational structure for the project using these concepts. PID/PP design teams and the Mission will, however, need to determine the project's range of interaction and correlation. Should the project expect to offer specific expertise and technology in forest resource protection and development to be integrated into other donor PNGTV communities of the region? Should the Project propose to underwrite major reorientation and overhaul to the Ministry of Environment, or only limited levels of retraining for MET provincial agents? Finally, the level of information exchange between area programs and projects should constitute a planned element in project design to counter verticality, redundancy, waste, and loss of regional cohesion in the fight against environmental loss.

## CHAPTER ONE

### INTRODUCTION

This document provides a set of researched concepts for the Natural Resources Management (NRM) Project for Burkina Faso.

#### OBJECTIVE

The objective of the project is to achieve sustainable increases in income and productivity through better management of annual croplands, forests, and rangelands. Specifically, this project addresses the objective by improving management of *terroirs* (village lands) and of *forêts classées* and *domaines protégés*. In the *terroirs*, the project will focus on improving management of soils (in the context of production systems) and on forests and range resources. In the *forêts classées* and *domaines protégés*, the focus will be on improving management of forests and range. The project takes a cross-sectoral or nonsectoral approach to achieving the objective.

#### TARGET AREA

The project will target the southwest of Burkina Faso, primarily the provinces of Houet and Comoe, and optionally Kenedougou as well. The spatial limits of the project should at the outset be kept flexible, for there may be reason to go beyond specific boundaries of these provinces if all the village *terroirs* surrounding a national forest which sits astride provincial boundaries are targeted for intervention.

#### ASSUMPTIONS

Based on discussions with the Mission and with others, these are some of the assumptions guiding a nonsector approach to this project:

1. **Improving management of soil, forest, and range resources ultimately depends upon the generation of sufficient benefit streams such that a portion can be continually reinvested back into the management of those resources.** This is not to say that all NRM activities have to necessarily become self-supporting; rather, it is to note that, on the whole, NRM activities should be seen as enterprises and not charity cases.
2. **Sustainable economic development depends upon concomitantly improving stewardship of soil, forest, and range resources.** Maintenance of forest resources depends to a significant degree on stabilizing agricultural production areas through increased productivity. Increasing agricultural productivity depends upon improved stewardship of livestock and forest cover. And improved livestock management depends upon improved management of crop residue and dry

season browse. Systems that integrate these activities are more sustainable than those built around one or two.

3. **Wider adoption in the project zone of existing NRM practices in the Sahel can substantially contribute to achieving the objective. This project needs to capitalize on that knowledge base. This is not to suggest that research for new practices and technique is not important; it only underscores the observation that a number of promising NRM practices are contributing to the objective elsewhere in the Sahel and may be appropriate for the project zone.**
4. **The knowledge base for the project design and implementation must be shared by the *groupement*, Government of Burkina Faso (GOBF) personnel, and USAID. If ownership resides only with USAID, the commitment to the ideas behind the project will, in all probability, also reside with USAID.**
5. **Establishment of appropriate tenure policies, financial strategies, and institutional reform (including cooperative development) will substantially contribute to wider adoption of NRM practices. The role of the GOBF is to establish those conditions that contribute to better and more responsible stewardship of soil, forests, and range resources by farmers, herders, and woodcutters. The conditions should lead to increasing incentives for resource managers to invest in the management of these resources.**
6. **Forest resources in the *forêts classées* and *domaines protégés* zones need to be placed under a management plan sooner rather than later. Encroachment into these zones is accelerating rapidly. Developing model management sites that produce a benefit stream will demonstrate that these resources can be managed as a self-supporting enterprise. While stabilizing agricultural production units will substantially reduce pressure on the forest and range resources, there may be little left to manage if action is not taken within the next few years.**

## CHAPTER TWO

### FORESTRY AND RESOURCE CONSERVATION

#### PROJECT GOALS AND PURPOSE

##### **Project Goals**

This project is designed to promote the integrated and sustainable management of natural resources in the southwest region of Burkina. Project support will be focused on the Provinces of Houet (Bobo Dioulasso) and Comoe (Banfora).

The welfare of the vast majority of the region's population is dependent on the productivity of the land and water resources they exploit. Improved management and conservation of lands used for agriculture and grazing, and of woodlands are critical to economic development efforts in the area.

##### **Project Purpose**

Sustainable management of the region's natural resources will be promoted by the development and diffusion of improved systems for using agricultural (soil and water), forest, and range resources. The improved resource management practices will be implemented primarily through village associations (*groupements villageois* and cooperatives), supported by field agents of the Ministry of Environment and Tourism (MET) and the Ministry of Agriculture and Livestock (MAE).

In view of the critical importance of controlling deforestation and promoting more stable, productive land use systems, the project will address three, interrelated problem areas:

- Uncontrolled clearing of the natural vegetation and harvesting of fuelwood, and the need to manage the use of forest reserves and woodlands and other noncultivated areas (over 70 percent of the land area), to meet the demand for fuelwood and other forest products on a sustainable basis;
- Unsustainable cropping systems and the need to diversify and intensify agricultural production, to increase incomes in rural areas while maintaining or increasing the productivity of village lands (*terroir villageois*) and decreasing the pressure to clear new farmland; and
- Conflicting and unstable patterns of livestock grazing, particularly by transhumant herds, and the need to integrate sustainable systems of livestock production into forest management and farming systems in the region.

As a first step, the project will support the preparation of a *schéma directeur* for the rational use of significant areas of wooded land within a 100-kilometer radius of Bobo Dioulasso. The project will help to control the production and marketing of fuelwood consumed by the major urban markets of the region, and insure that the fuelwood is produced on a sustainable basis by village-level wood cooperatives from unclassified, forested village lands (*domaine protégé*) or from classified forests (*forêts classées*) in close proximity to Bobo Dioulasso.

Sustained yield management of wood will be integrated with the improved management of rangeland (forage, pasture) and other forest resources such as honey, medicinal plants, and wildlife, and with the ongoing efforts to raise rural incomes while promoting more sustainable systems of agricultural production at the village level.

Support aimed at restoring and maintaining soil fertility and the promotion of other sustainable agriculture practices will be a second important component of the project. These activities will be developed in the context of improved village-level land management, as pursued under the Programme National de Gestion des Terroirs Villageois (PNGTV).

A third major activity of the project will be the conservation and improved management of the Comoe-Leraba natural area located to the south and southeast of Banfora. Although much of this area already has been designated as forest reserves (classified forest or *forêt classée*), more effective protection and management is needed to prevent or control the exploitation of this area by poachers, farmers, herders, and woodcutters. The project will aim to stabilize land use in the areas adjacent to the natural areas, prevent further unplanned encroachment and clearing of the reserved land, and provide for the rational use of the area's natural resources.

Each component will emphasize training and other means to build institutional capacity at the village, departmental, and provincial levels.

## PROJECT JUSTIFICATION AND STRATEGY

### Project Justification

Wood currently accounts for over 90 percent of the energy consumed in Burkina. Forest resources are a significant source of employment and income for most rural households, and provide a wide array of products and services essential to rural economies in Burkina. A recent study by the Food and Agriculture Organization (FAO) estimated that 15 percent of the GDP is derived from forest-based resources, including fuelwood, poles and other construction timber, forage, edible fruits and other forest products, medicinal plants, wildlife, and fisheries. The quality and productivity of the country's soil and water resources are also closely tied to the condition of its forest cover.

Some 70-80 percent of the land area of Burkina supports a natural vegetative cover of woody and herbaceous plants that constitute the forest and range resources of the country. At present, these resources are exploited with little regard to sustained-yield management and the conservation of their long-term productivity. If present trends of overuse and land degradation continue, current efforts to improve agricultural productivity will be compromised, and the prospects for developing rural economies will be undermined.

The Ministry of Environment and Tourism is the institution directly responsible for the conservation and management of natural resources in Burkina, and includes the country's Forest Service, Fisheries Service, and Parks and Wildlife Management Services. However, MET is severely constrained by a lack of trained personnel, inadequate operating budget, and inefficiencies in its organization and administration. Most MET agents working at the field level have traditionally been preoccupied with forest protection and enforcement of laws and regulations on wood cutting, control of bush fires, and livestock grazing.



The Ministry of Agriculture and Livestock includes the agriculture extension and livestock services, and has a much greater and more positive field presence at the village level. However, until recently, the MAE has focused its efforts on increasing agricultural production, with little regard to sustainable increases in soil productivity and improved natural resources management.

Over the past few years, the attention of both MET and MAE agents has shifted to include support for tree planting, agroforestry, soil fertility management (*fosse fumier*), soil and water conservation (*lutte contre l'érosion and CES/DRS*), more efficient use of fuelwood (*foyers améliorés*), and the protection of remaining wooded areas (*mise en défense*). MAE still needs to give more attention to the promotion of sustainable agricultural practices and improved management of rangeland resources, while MET should devote more effort to the management of remaining woodlands in ways that meet the needs of local communities and directly benefit these communities through diversification of economic activities, increased income, and more productive use of natural resources at the village level.

## **Project Strategy**

### **Improved Management of Forest Resources**

After many years of project assistance focused on fuelwood plantations and rural woodlots (*bois de village*), a series of recent projects has contributed to significant advances in approaches for the community-based management of natural forests in the Sahel. Beginning with the USAID-funded project activities in the Guesselbodi and Gaya forests in Niger, and in the Dinderesso forest in Burkina, much valuable experience has been gained in the approaches and techniques for supporting natural forest management. An ongoing forest management project supported by the FAO in the Nazino forest and adjacent woodlands of Kassou in Burkina has further developed the state of the art to a point which clearly demonstrates the feasibility of management of natural forest by village cooperatives for a sustained yield of fuelwood and other products. The NRM project will build on this experience and apply it in the southwest region.

### **Sustainable Agriculture and Soil Fertility Management**

The USAID-funded ARTS project (Agriculture Research and Training program) is helping to develop the technical packages needed to increase the sustainability and productivity of agriculture. The ARTS project also provides a link with other research in soil and water conservation and agroforestry, which is being carried out by INERA and IRBET, respectively, in the Ministry of Higher Education and Research (MESRES). Working together, the ARTS project and the Natural Resource Management project will help to ensure that appropriate technical packages are developed and utilized within a framework of sound land-use and improved natural resource management.

In this context, an important element of the project will be support for the development of village-based, rural cooperatives. The project will make use of the proven capabilities of U.S. private voluntary organizations (PVOs) and nongovernmental organizations (NGOs) to organize and assist village-based management of natural resources (especially in the degraded areas of the central plateau), and stimulate the extension of these NGO activities to villages in the southwest region.

### **Support to Village Land Management**

Over the past several years, considerable experience has been gained with a series of pilot projects coordinated under the national program for village-based resource management. The NRM project will build upon this experience in developing a methodology and step-by-step approach for supporting integrated land use planning and sustainable resource management at the village level.

Although these pilot activities have drawn attention to the full range of natural resources utilized at the village level, they have yet to resolve all the issues associated with potentially conflicting land uses, resource access and control, and incentives for improved natural resource management practices. In particular, there is a need to foster more collaboration between the agents of the Ministry of Agriculture and Livestock and those of the Ministry of Environment and Tourism, to improve the use and management of noncultivated lands and expand the contribution of activities other than farming to the village economy. Building on the experience of the PATECORE project (Province of Bam), the project will provide support and encouragement for fruitful collaboration between MET and MAE, as well as other relevant institutions (Ministère de l'Action Cooperative des Paysans, MESRES/INERA and IRBET, and so on).

It is also important to note that while the PNGTV program is also gaining ground in selected pilot villages, in most areas the region is still subject to large-scale, frequently unsustainable, changes in land use and unplanned and uncontrolled exploitation of natural resources.

### **Improved Land Use Planning and Coordination of Development Programs and Policies relevant to Immigration and Livestock Grazing**

In-migration from the densely settled Mossi plateau to areas recently cleared of river blindness (onchocerciasis) and other wetter zones in the south as well as the displacement of families from farmed-out areas is disrupting traditional (and generally sustainable) land use and farming systems in the less densely populated southern regions of Burkina.

A series of area development and commodity projects and associated policies narrowly focused on increasing the production of cotton and other income-generating agricultural crops has also contributed to high rates of land clearing, depletion of soil fertility, and land use conflicts. Promotion of animal traction and the use of tractors (*paysan motorisés*) has led to an increase in the area of cropped land, but farm-level investments and changes in farming practices needed to maintain soil organic matter and fertility have not yet materialized. Consequently, farmland is exhausted and new land is being cleared at an accelerating rate. The project will stimulate a re-assessment of the sustainability of farming practices on a village-by-village basis, and support the diversification of income-generating activities tied to more sustainable patterns of resource use.

Additional pressures on the resource base are being generated by an influx of herders and livestock squeezed out of traditional grazing areas by the development of irrigated agriculture in *bas-fonds* and the steady expansion of cultivated land. This expansion has resulted from a high rate of population growth and a breakdown of traditional shifting agriculture and fallowing practices. The project should help to make more rational use of the large areas of remaining natural forests and woodlands that include important rangeland resources, as well as foster more intensive and cooperative use of pasture resources at the village level.

Finally, the significant and growing demand for woodfuels has stimulated the cutting and clearing of woodlands by wood merchants and by newly settled farm families anxious to increase their income in the dry season. The project will help to shift income generation from fuelwood cutting to a sustainable practice integrated into the implementation of village-level resource management and land use plans (*plan d'aménagement et plans de gestion de terroirs villageois*). This should help to reduce the reliance of villagers on income generated from cotton production, and reduce their vulnerability to drought-related shortfalls in income.

Another element of the project will address the critical policy constraints and other factors needed to increase the incentives for improved natural resources management at the village level. In particular, the project will work with the PNGTV and other donors to support the adjustments and elaboration needed in the Réorganisation Agricole et Foncière Act (RAF). Other policies issues that will be addressed include MET policies for forest management (fuelwood harvesting controls and permit systems; pricing of wood and alternative fuels; prescriptions for forest management plans, and so on) and MET/MAE priorities for extension and training.

#### **Protection and Improved Management of Significant Natural Areas (Proposed Comoe-Leraba National Park/Forest Reserves)**

As a result of uncontrolled land clearing, some 60,000-100,000 hectares of forested land are being converted to other uses every year in Burkina. In the process, economically and ecologically significant areas are being degraded. By providing a modest level of support to the Ministry of Environment and Tourism in the short and medium term, this project will enable the country to check the uncontrolled and unsustainable conversion of the most important remaining forests and natural areas, and reduce the costs of rehabilitation and management over the long term.

A particularly significant resource is included within the boundaries of the Diefoula and Dida national forests, adjacent to the Comoe and Leraba rivers. Until recently, these areas were subject to modest levels of poaching, but suffered little from encroachment and habitat destruction. Over the past five years, however, poaching has sharply increased, together with the threat of uncontrolled grazing, destructive bush fires, and clearing of new farmland within the reserved areas. In view of their biological significance and development potential, field studies have been initiated as a prelude to converting the two forest reserves and adjacent areas into a national park.

In the short term, the project will aim to forestall further land clearing within the reserve, by providing support for forest guards, surveillance, and technical assistance. Over the medium term, a management plan will be developed for the reserve, and implemented in close cooperation with the adjacent villages and user groups. Project interventions will help to minimize disputes over land use adjacent to these natural areas, and lay the foundations for the multiple-use management of these areas in ways responsive to and supported by the local communities dependent on these resources.

### **TRAINING COMPONENT**

During the course of our mission, the importance of training activities was underscored by many people. We are proposing that the project include a substantial training component, targeted in the following areas.

### **Training for Paysans**

Training of villagers in natural resource management and in cooperative management is important, particularly among those involved in the CVGT or *commissions villageoises de gestion de terroirs*. CLUSA (Cooperative League of the USA/National Cooperative Business Association) could take the lead in this area, and organize short courses and other training events aimed at building the capacity of the CVGT to carry out the functions of the village committee: inventory, mapping and zoning (delimitation), prescription of technical guidelines (*cahier de charges*), negotiation of contracts, arbitration of disputes, and management of common resources (such as *fonds de roulement*).

CLUSA, in cooperation with other experienced NGOs, PVOs, and technical services with appropriate expertise, could also help to organize village-level training and demonstration of the improved natural resource management practices identified in the NRMS assessment. Some efforts of this type are currently carried out through extension agents of the agriculture and forest service, but they will need to be strengthened and expanded.

### **Training for Government Technicians**

The project staff will also need to develop training materials and short courses (*recyclage, cours de perfectionnement*) to train trainers among MET and MAE/CRPA staff in areas that have not been adequately covered in their general education and training. For example, the state of the art in natural forest management, range management, and game ranching is evolving rapidly, and has not been covered adequately in the curriculum and training programs of MET and MAE agents.

These courses would aim to build a capacity among government technical staff to disseminate and promote the adoption of improved practices for the management of forest, range, and soil resources within the *terroir villageois*. Practices to target would include the preparation and implementation of *plans de gestion* for natural forests/community forests, which provide for the sustained yield harvesting of fuelwood and other products, for example. Another area is the preparation and implementation of grazing contracts, which take account of the carrying capacity of designated pasture/range resources and the prospects for increasing the carrying capacity through controlled early burns, rotational grazing, re-seeding and so on. Training would also include such techniques as the use of water levels and other simple devices to lay out infiltration ditches and erosion control dikes along the contour, and other techniques aimed at reducing soil loss and at restoring and maintaining soil fertility and soil organic matter.

### **Training Materials and Institutions**

Drawing on the experience and training materials generated by the Guesselbodi project in Niger, the Nazino and Nazinga projects in Burkina, and others, the staff could work together with trainers at Matourkou (Centre Polyvalent Agricole) and Dinderesso (Ecole Nationale des Eaux et Forêts) to organize and carry out such training sessions on a regular basis. Priority would be given to staff involved in implementing project activities in Houet and Comoe, but the training materials could also benefit technicians working in other regions.

Once government (and PVO and NGO) technical staff have received training as trainers, they could be provided additional logistical support to organize village-level, on-site training and demonstrations. This work could be planned and organized through the *groupement villageois* and the CVGT.

## Proposed Technical Assistance

### Long Term:

Rurai development/extension specialist (team leader)

Forest Management Advisor

Cooperatives Specialist (CLUSA)

Project Administrator

Parks/Protected Areas Advisor (?)

Volunteers (Peace Corps?) (Dutch, French, German ??)

### Short Term:

Wood Marketing/Control System Specialist (3 months)

Land Use Planner (3 months)

Tenure Specialists (Land Tenure Center)

Farming Systems/Forestry Extension Advisor (to backstop rural dev./ext. specialist and Forest Manager, and to link with ARTS, INERA, IRBET, and so on)

Training Specialist (to work with Forest Manager, especially)

Livestock/Range Management Specialist (to backstop team effort)

## FORESTRY: BACKGROUND AND PROBLEM ANALYSIS

### Lack of Natural Forest Management

It has been estimated that about 50 percent of Burkina is still covered with natural vegetation, which ranges from grass savannah in the north to gallery forests in the south. Approximately 14 percent of the country is gazetted as national forest (*forêt classée*), national reserve, and national park. This leaves about 36 percent of the territory unfarmed and outside of national forests, reserves or parks. This area is known as *domaine protégé*. Almost all of the gazetted areas were set up during colonial times.

The Burkinabe Forest service, like many other forest services in Africa, has been involved in a number of different activities including: village woodlots, seedling production, tree plantations, agroforestry, woodstoves, and soil conservation. Without entering into detail, one could safely say that the impact of these projects has had little positive impact in controlling decertification or maintaining soil fertility.

At the same time that foresters were involved with non-forest-type activities, practically nothing was done to manage or protect existing natural forests. As a result, many of the gazetted forests have been lost entirely to itinerant farmers. Due to the lack of ability of the forest service to control the situation, it is not surprising that other government agencies (mainly agriculture) feel that the forests should be cut, burned and cultivated. "Do something with these areas or give them to us."

As a result, the remaining forests in Burkina Faso are seriously threatened. Although the team did not come across any reliable studies, the estimates from the documentation range between 60 and 100 thousand ha of natural forests are being cut and burned annually by itinerant farmers.

### **Experience of Nazinon and Nazinga**

In spite of the lack of forest management for the country as a whole, two very interesting integrated forest management schemes at Nazinon and Nazinga are being implemented south of Ouagadougou in the provinces of Sissili and Nahouri.

Although there are still some major issues to be addressed in both of these projects, the results to date are excellent. The projects have proven beyond doubt that proper forest management can restore vegetative cover and wildlife to levels unknown since precolonial times. Moreover, they have demonstrated that forest management can be profitable in real economic terms.

Nazinon and Nazinga are operated as small businesses. There is a marketable product (firewood at Nazinon and wildlife at Nazinga) and a market. Furthermore, revenues generated from the exploitation of the product are reinvested to maintain the resource base, increase production, and improve the efficiency of the operation through research and development. The operations are carried out in consultation and collaboration with surrounding villagers, some of whom are employed by the project. "The best way to convince a villager that you are there in his/her interest is to give that person a paycheck" (Clark Lundgren/ADEFA). Burkina is fortunate to have these projects, which serve as models for future NRM interventions. They represent the state of the art for all of West Africa in terms of working with local people to develop sustainable, ecologically sound approaches to natural resource management.

### **Major Issues**

Although the NRM Assessment document presents a good overview of these projects, it fails to address several fundamental issues that must be resolved before USAID or other donors initiate similar NRM projects using the approaches developed at Nazinon and Nazinga.

### **Tenure and Decentralization**

The operation at Nazinga was set up over a period of 10 years by a Canadian NGO, the Association pour le Développement de l'Exploitation de la Faune Aménagée (ADEFA). The project was run by two brothers (both who grew up in Burkina as sons of missionaries). The first phase of the project was research and study oriented. However, once the main project activities of game ranching and hunting were underway, it became clear that the operation was not only feasible but lucrative. At this point, the government felt that ADEFA had too much control and that it was time for the forest service to take it

over. Within one year's time the restaurant closed, the safari contracts canceled, and poaching is again a major problem. In other words, to no one's surprise, the operation collapsed.

In the meantime, it should be noted that the United States has given the Burkina Faso forest service US\$75 thousand from the Ambassador's Fund to help put the operation back on track. This maneuver was a serious mistake. Why should the GOBF care one way or the other whether the operation is sustainable or profitable as long as there are donors willing to subsidize an otherwise profitable enterprise. This type of aide, as small as it may seem, does nothing more than encourage dependency, corrupt officials and disrupt the negotiation process between ADEFA and the local people and the government.

ADEFA has been approached by the Minister from MET to consider coming back to Nazinga. ("Nous savons que nous avons commis des erreurs.") But it is not at all obvious that ADEFA will agree to the terms and conditions MET is proposing. ADEFA is pushing for an approach that would give the local people control over the operation as a private enterprise. Of course, the enterprise would have to abide by a management plan and some of the proceeds would be reinvested into the operation to pay for recurrent costs, maintenance, and so forth. The role of the GOBF forest service under this scenario would be to provide technical assistance and assure that the enterprise respected the terms and conditions of the management plan.

The GOBF, on the other hand, is in no position to give up its tight control of the operation and has proposed a long, drawn out process by which privatization could be considered after seven years. (For details, contact ADEFA). In any case, this move by the GOBF leaves one with serious doubts as to the extent that it is willing to decentralize authority and allow local user groups to exploit, manage, and maintain surrounding forests that have been their natural heritage within the traditional context.

### **Sawmills at Banfora**

There are two sawmills at Banfora that continue to cut highgrade timber logs mainly from the Comoe Province. According to several people familiar with the forests of the area, most of the *Khaya senegalensis* and *Azelia africana* have been cut from the area. This operation been going on for a number of years between the Minister of MET in Ouagadougou and the local sawmill operator. To date, local foresters have not been involved in the process of establishing cutting schedules or controlling the cut.

Similar arrangement are being made between the minister and private individuals for hunting in the forest of Dida and Mou with little or no participation of the local foresters.

### **Forestry Fund**

Another issue that was also discussed at the workshop on natural forest management in May is the *fonds forestier*. At present, such a fund exist for Toumousseni and Nazinon. The purpose of the fund is to create a revolving account to pay for the recurrent cost of forest management as defined by an agreed-upon annual work plan and budget. At Toumousseni and Nazinon the fund is operational but it is not clear how the fund will continue once the projects finish. How does one institutionalize such a fund given the problems associated with such funds in the past?

After a long debate, the workshop concluded that this fund should be managed by local groups (cooperatives, NGOs, *groupements*, associations). In other words, the local group would be responsible for carrying out the prescribed forest activities as defined in a yearly work plan agreed upon by the government and the group. The role of the forest service would be to provide technical assistance to develop the work plan and assure that the local group abides by the terms and conditions of the work plan.

The management team at Nazinon has proposed an approach that would allow local groups to manage the fund that is currently managed by the project. This should be followed closely by USAID and other donors. USAID should collaborate with the FAO representative in Ouagadougou to encourage the government to accept the approach being proposed by the project and institutionalize the approach so that it may be replicated in other forest management interventions.

## **LIVESTOCK SECTOR: BACKGROUND AND PROBLEM ANALYSIS**

One of the biggest challenges facing the countries of West Africa today is how to restore the threatened livestock sector. In Burkina Faso livestock contributed 20 percent of total exports in 1970. In 1989 it had fallen to 12 percent and will continue to fall unless measures are taken to reverse this trend. To do this, one must first review the recent history of the sector to gain a better understanding of today's problems and possible solutions.

### **Historical Perspective**

The following is a synopsis of the livestock sector in the Sahel from 1950 until today. It presents the larger picture for many parts of the Sahel but should not be construed as being true for the entire region given the irregularity of rainfall and the different approaches adopted by donors and governments after the drought of 1970-1974.

Many of the problems in the livestock sector today can be traced to middle of this century when rainfall was relatively abundant and the livestock population increased significantly, especially in the northern Sahel. Some have estimated that the number of cows increased fourfold between 1950 and 1960 in this area (National Academy of Science). When the drought of the early 1970s occurred, traditional grazing lands could no longer support the number of animals that had saturated the pastoral zones 20 years earlier. As a result, entire herds were wiped out and many herders were obliged to leave the northern Sahel in search of pasture in higher rainfall zones to the south.

In response to this, livestock projects were initiated across the Sahel and concentrated in areas considered to be the true "pastoral zone." Such areas are inhabited by nomadic and semi-nomadic clans and characterized by low rainfall (200-400 mm average annual rainfall), sandy soils, and annual grasses. It is no secret that most of these projects failed miserably and remain one of the main reasons why livestock projects are not favored by donor organizations.

In spite of these failures, the projects generated much useful information and a much keener awareness of the problems. One of the biggest lessons learned from the army of anthropologists, veterinarians, economists, range managers, and sociologists that spent many years following herders and recording data was that the traditional livestock/range management system employed in these zones is very well adapted to the ecological and social realities of the northern Sahel. The key to surviving in this



zone is flexibility and the ability to move herds in response to rainfall. In addition, herders have developed an effective monitoring system of range conditions and are able to move herds with relatively few conflicts arising between clans. Although there is definitely a need to develop strategies to help herders cope during the drought years, during normal rainfall years the traditional system works.

It should be noted that many of the livestock projects initiated in the pastoral zone during the 1970s tended to undermine the traditional system. For example, in some areas, boreholes were installed with little regard as to the way these would disrupt the traditional control of water. The results were disastrous; many of these wells have since been closed.

Today, however, the situation has changed from 20 years ago. Many of the herders from the northern Sahel who lost their herds during the drought have been forced to relocate to higher rainfall zones. Some of these people have given up herding altogether and others have managed to rebuild their herds and have relocated to areas in southern Niger, southern Burkina Faso, northern Nigeria, Benin, Togo, Ghana, and Ivory Coast. The increased presence of herders has disrupted the delicate relationship that existed between herders and farmers. As a result, there are serious conflicts that are increasing as more herders roam into new areas in search of pasture. In response to this, governments have adopted severe policies to deal with the problem. For example, in some areas of northern Benin, the government has authorized forest service agents to shoot cows that come from "the north." Ghana and Togo have also adopted policies to force herders out of their countries.

The end result of this is that there are thousands of herders roaming around the southern Sahel in search of pasture. To date little has been done to resolve the problem in spite of numerous conferences and strategy proposals.

### **Range Tenure**

One of the main stumbling blocks to addressing the above situation is the reluctance of governments to authorize exclusive grazing rights to herders in areas that have been set up as grazing reserves and subjected to laws governing the use of the range with respect to stocking rates, maintenance of the range, and so forth. Although several projects have begun in Burkina Faso, tenure remains a central issue. Herders will not invest in sustainable range management programs until they are guaranteed some control over the use of the range and are given authority to keep outsiders from entering a given territory.

Tenure is also an issue within *terroirs* that have been demarcated and subjected to management schemes through the PNGTV or National Plan for the Management of Village Lands. It is not at all clear how herders are or are not integrated into these programs. This is a particularly serious problem in *terroirs* that have traditionally been frequented by herders during certain times of the year during the course of a transhumance practice.

Although the livestock sector is addressed in the Agrarian Reform Act of 1984 whereby pastoral rights can be accorded to an individual or a group of individuals (D. 85, arts. 54-70), these laws have not yet been tested or applied in the field.

### **Sedentarization of Herders**

The GOBF passed laws within the *trots luttés* campaign to control the movements of animals in an effort to sedentarize herders. Efforts to enforce these laws have met with much opposition by herders and fortunately have been unofficially dropped.

Sedentarization is still viewed as being one of the best ways to integrate herders into the mainstream of Burkinabe society. However, little has been done by the GOBF to address herders' problems to gain access to improved health and education, and they remain to a large extent marginalized. Although livestock officials claim that all they really want to do is "organize the transhumance," it remains unclear what this really means.

### **Lack of Range Management**

Livestock services in Africa are directed by veterinarians and have traditionally focussed on animal health issues such as providing vaccines. This has meant that little has been done in the area of range management in spite of the fact that the condition of the range has been slowly deteriorating over the last 20 years.

Although, there is now an awareness within livestock services that proper range management is vital to the health and well being of the herds, little is being done to develop viable range management programs as has been done to a certain extent with firewood in the forestry sector.

### **Situation des Zones Pastorales du Burkina Faso**

The MAE published *Situation des Zones Pastorales du Burkina Faso* in May 1990 to present an overview of MAE's strategy to address the livestock sector in Burkina Faso. The document lists all of the agropastoral zones that have been or are presently being financed by donors. These include:

- Nouhao, Boulgou Province;
- CELIET de Samorogouan, Kenedougou Province;
- Sideradougou, Comoe and Houet Provinces;
- Sondre-Est, Zoundwego Province;
- Yalle, Sisili Province;
- Gadeghin, Gansourgou Province; and
- Mankarga V7, Ganzourgou Province.

The Action Plan Team did not have enough time to visit these sites, but did meet with FED (Sideradougou) and several individuals who are familiar with some of these projects. Results of these interventions are mixed. At Sideradougou, serious conflicts arose between herders and farmers once the project zone was transferred from the map to the ground (see details below). Due to the nature of the

conflicts, FED stopped the project from 1985 to 1987. At Gadeghin, the project zone of 6,000 hectares was not large enough to accommodate the number of livestock in the area.

In any case, there is a lot of experience in Burkina Faso that needs to be further investigated. It is strongly suggested that a short-term consultant be fielded to visit all of the above sites to evaluate and compare the different approaches. One area of concern is the level of infrastructure and other "goodies" offered by the different projects. Past efforts have shown that huge investments in *ranch*-type projects often focus on the project input component and lose sight of the real issues such as tenure and carrying capacity. As with firewood, livestock is a lucrative industry that can generate substantial revenues. There is no reason why herders cannot begin to share the burden of paying for infrastructure and the recurrent costs of managing a pastoral zone such as guards, roads, and range improvement. To what extent herders are willing to pay for these costs is not obvious, but there is already a precedent at Gadeghin where fulani herders supposedly paid for some of the costs associated with demarcating the zone. This is a start.

It is recommended that the same CLUSA approach being presently carried out in Niger and Mali in the forestry and agriculture sectors be used in Burkina Faso. One of the main advantages of this approach is that local user groups are accorded access to credit to pay for infrastructure, recurrent costs, and even receive technical assistance.

Moreover, MAE has proposed another 44 sites (*Sites Potentiels de Zones Pastorales*) for future interventions. The total area of these sites is almost 2 million hectares. The identification of these sites should not be viewed lightly. It is a big step and demonstrates clearly that GOBF is thinking about the problem, looking for solutions and willing to set aside a relatively small but important part of the country for herders. To what extent herders will have tenure over these areas remains unclear, but at least the areas are drawn on a map and the Secretary of the State for Livestock is anxious to attract donors to intervene on each of the 44 sites.

### **Regional Dimension of The Problem**

Given the regional dimension of transhumance and the need for communication and coordination between countries to analyze the issues and develop a regional strategy, it is important that dialogue be initiated and maintained. At present, the only country that has a signed agreement with Burkina Faso addressing the livestock sector is Mali (1988). However, CILSS (Comité International pour la Lutte contre la Secheresse au Sahel), the CEAO (Communauté Economique de l'Afrique de l'Ouest), and CEBV (Communauté Economique de Boeuf et Viande) are also involved in promoting and coordinating between countries affected by the movement of animals. In addition, a workshop on livestock with representatives from Ivory Coast, Mali, and Burkina Faso is scheduled to take place in November in Banfora. USAID should continue to support policy dialogue between countries and the proposed consultant should contact all of the organizations mentioned above and report on the status of pending bilateral conventions.

### **Situation in the Southwest**

After the drought of 1970-1974, many of the fulani herders moved from the area of Nouna (Kossi Province near the Malien border) in search of better pasture to the south mainly in the Comoe Province. The majority of these herders are concentrated in areas south of Banfora and migrate to grazing areas around the Comoe River during the dry season.

In response to this, FED initiated an effort in Sideradougou in the early 1980s to create a pastoral zone of 168,700 ha which was demarcated on a map and declared the "project zone." Serious conflicts arose between herders and farmers when the project began the process of *zonage*. As a result, the project was shut down from 1985 to 1987, but was given new life in 1988 with hopes of learning from mistakes of the past.

Two of the 44 sites cited above have been proposed for the Comoe Province: Bougoula (92,000 ha) and Ouangolodougou (60,000 ha). It is recommended that the short-term consultant review the criteria by which these sites were chosen and visit both sites to talk to herders and farmers within and around the proposed project area.

The other major issue in the Comoe Province is the presence of the tse-tse fly. Although past efforts have been carried out in the area to eliminate the fly, it is still a problem especially around the Diefoula and Dida forests where the fly is associated with the wildlife. This also needs to be further investigated.

#### **COMMENTS ON WORLD BANK/UNDP/ENERGY SECTOR MANAGEMENT ASSISTANCE PROGRAM FOR BURKINA FASO**

The World Bank has just finished a comprehensive study of the household energy sector in Burkina Faso under the auspices of the World Bank/UNDP/Bilateral Aid Energy Sector Management and Assistance Program (ESMAP). Similar studies have been carried out in other African countries to address energy related problems and assist governments to define long term development strategies. The study in Burkina Faso was co-financed by the Governments of Norway and the Netherlands. The following comments are written by John Heermans and Bob Winterbottom (World Resources Institute) while on mission in Burkina Faso as part of a multidisciplinary team to develop an Action Plan for USAID for natural resources management. The comments do not necessarily reflect the views of USAID nor the other members of the team.

#### **Emphasis Remains on Shift from Biomass to "Modern" Fuels**

Unlike other ESMAP studies, this one offers more positive direction with regard to the importance of conserving and managing remaining woodstocks that account for about 90% of household primary energy demands. In spite of this, however, the study adheres strongly to the Bank's policy as defined in the Long Term Perspectives Study for Africa (LTPS), which encourages a switch from biomass to modern fuels such as liquid propane gas (LPG) or kerosene (Pg. xi). This approach to the energy sector in Africa remains alarmist, inaccurate, and unfair to the poor; in addition, it discourages countries from managing their forests, which have and will continue to be the most important source of energy for a long time despite World Bank predictions to the contrary.

In 1987, Burkina Faso imported 130,000 tons of oil products at a cost of US\$ 47 million. From what sector of the already strained economy is Burkina Faso going to pay for a higher import level of petroleum products?

It is estimated that between 20-30 thousand people are now directly or indirectly employed in the fuelwood sector. Sustainable production of wood fuels will generate local employment. How much local employment will be generated by the increased use of LPG and kerosene? Donors should be investigating

ways of employing another 30 thousand people by rationally exploiting untapped woodstocks rather than preparing Burkina Faso to switch to a nonrenewable source of imported energy.

One of the biggest fallacies associated with the switch to modern fuels mentality is that somehow there will be a net positive effect to the environment. "Between now and the year 2000, the intensive and concentrated urban fuelwood demand will contribute directly to environmental degradation" (Pg. 64). This is far from the truth. In the first place (as the report states), most of the deforestation that occurs in Burkina Faso is caused by itinerant farmers who clear land for farming, not by woodcutters who gather dead wood or lop branches from live trees without killing them. Secondly, it is well known that the best way to assure that tropical forests remain forested is to assure that the forests have a value to the local people. In Burkina Faso, the FAO project in Nazinon is developing an approach to pay for the recurrent costs of maintaining and enriching a national forest with profits generated through the sale of firewood. If everybody in Burkina Faso could afford to switch to petroleum tomorrow, such innovative schemes would collapse. It is only by guarding a healthy demand for fuelwood and other forest products that the government can justify saving these forests as opposed to converting them into agricultural land.

The reality is that nobody can predict with any degree of accuracy when the woodstock will be depleted to the point that people will consider other forms of aggregate household energy. Although demand is fairly easy to predict (if population figures are accurate), supply is far more problematic given the lack of wood production/tree growth figures and the inaccuracies of national fuelwood inventories. In addition, it is not obvious from the ESMAP fuelwood survey whether trees that grow in individual fields, gardens, cities, villages, and compounds, and are carefully cut by women in a manner whereby the tree is not killed were considered in the equation. There are many areas throughout the Africa where such adaptive practices provide 100% of villagers fuelwood needs on a sustainable basis.

Raising taxes and subsidizing petroleum products is out of tune with the social and economic realities of Africa. In Niger this has served only to promote a black market of fuelwood that did not exist before the tax increase. Raising the price of fuelwood and subsidizing petroleum would do little more than create a heavier economic burden for the poor and benefit the wealthy who can afford to buy modern cooking appliances.

Another sector which has not been properly discussed in the ESMAP report is alternative sources of renewable energy such as solar and wind. There has been a considerable amount of progress made in the last five years in Africa especially in the area of solar water heaters (which account for approximately 25 percent of household energy requirements in Burkina Faso). Such innovative approaches should be recognized, or at least considered, as a viable alternative to switching to nonrenewable energy.

In sum, it is doubtful that there will be any significant switch from biomass to petroleum products as long as there are important remaining sources of fuelwood. If such a switch is to occur, there is no reason to force it. In fact, the conservation and management of Burkina's remaining forests can happen only if these forests can contribute to the national economy and remains a stable market for fuelwood and other forest products remains. Unlike other countries in the Sahel, Burkina Faso is not faced with a deficit in biomass fuel. The estimated production is approximately twice the estimated consumption not counting the standing volume. Large areas of remaining forest land exist in the oncho-free zones that offer enormous potential to provide deficit areas with fuelwood and or charcoal. Such areas are being lost, however, due to an influx of farmers from the central plateau in search of new areas to settle. If measures are not taken to protect and manage these areas in the immediate future the prospects for the sustainable use of a potentially renewable resource will be seriously compromised.

## **Woodstoves**

The Bank has and continues to put a heavy accent on the production of woodstoves. This activity is certainly worthwhile where it has worked and should be continued, however, not at the expense of other priorities such as conserving and managing remaining forests.

## **Management of Degraded Fallows**

After presenting a strong case for natural forest management, the Bank proposes a US\$ 5 million project to manage degraded fallows. These areas should not be considered as a priority in the immediate future. Degraded fallows are more or less stable in their degraded state. Much work has already been done on these sites by NGOs and the GOBF to address soil erosion problems. Perhaps similar work should begin to develop sound approaches to forest management using a "model site" approach. In the meantime, however, there is a need to continue to delineate the remaining natural forests and implement similar management schemes as is now being done at Nazinon and Koudougou in Burkina Faso and Guesselbodi and Torodi in Niger. Natural forest management is no longer a concept; it has been largely demystified and the state of the art for all of the Sahel is now being carried out in Niger and Burkina Faso. The time to act is now, not in 10 years when the resource base has been cut and burned. The FAO project in Nazinon and the UNSO project in Koudougou will have managed approximately 200,000 hectares of the estimated 700,000 around Ouagadougou (conversation with Manuel Soto Flandez, FAO). The remaining 500,000 hectares should be considered as a top priority by the government and donors.

## **PROJECT DESCRIPTION**

The proposed project is composed of two major components:

- Land use planning/natural resource management within a 100-kilometer radius of Bobo Dioulasso; and
- Protection and management of natural areas in the Comoe Province.

### **NATURAL RESOURCE MANAGEMENT: BOBO DIOULASSO**

#### **Macro Land Use Planning**

This exercise will focus on an area within a 100-kilometer radius of Bobo Dioulasso to control deforestation and improve the management of remaining natural forests in the area. The end result will be a *Schéma Directeur* to define short-, medium- and long-term strategies to prioritize forests with the highest potential for management around Bobo. This activity will begin as soon as possible after the project has started and should be completed within a period of three months.

**Forests with the highest potential for management will be prioritized based on the following criteria:**

- **Forestry potential in terms of volume and area;**
- **Proximity to Bobo Dioulasso in terms of distance;**
- **Access to Bobo Dioulasso in terms of roads;**
- **Land tenure in terms of whether the area is within a national forest or not;**
- **Local participation in terms of willingness and existence of local structures that have been involved in natural resource management within the framework of a GTV program; and**
- **Level of deforestation in terms of percentage of forest taken over by farmers and intensity of woodcutting.**

### **Forestry Potential**

Because firewood is the most important forest product of the region due to the firewood market in Bobo, it is important that areas with the highest firewood potential be identified and prioritized for management. Such areas can be identified on recent satellite imagery at a scale of 1:50,000 or using recent aerial photos purchased from IGB. Once the areas are identified on the images or photos, ground truthing teams will visit the forests to verify the interpretation. The volume of wood per hectare can be estimated using methods developed in earlier forest inventories (FAO/Forest Inventory Project, Cameratti, 1983).

Forestry potential can also be evaluated in relative terms (high, medium, low and nonexistent) for different forest types based on density as interpreted from aerial photographs and site visits to verify species composition and how the forest is being used. Note that the University of Toulouse is working with the University of Ouagadougou in collaboration with the Burkina Faso Forest Service to update vegetation maps at a scale of 1:1,000,000. These maps could be used at the macroplanning stage and later enlarged for forests that have been prioritized for management.

In Niger, where similar land use planning exercises were carried out under the USAID-financed Forestry Land Use and Planning Project (FLUP), local wood merchants were consulted to identify areas with the highest firewood potential. This can be done through interviews or by following the wood trucks or from town to the forest. Ideally, both approaches should be combined — satellite/aerial photo interpretation and making use of the knowledge of local wood merchants.

Larger forested areas should be given priority over smaller areas to maximize the impact of future management interventions. There is little difference in the amount of effort and project input needed to manage 100 hectares and that needed to manage one 1,000 hectares. Given the shortage of personnel and foresters with management experience, it is essential that larger areas be prioritized. The FAO management team working at Nazinon has determined that management units should not exceed 25,000 hectares. For example, a forest of 100,000 hectares would be divided into four separate management units. Each management unit would be treated apart requiring separate maps, management plans, management teams, budget, and so forth.

Access to the market in Bobo must be considered in terms of distance and conditions of the roads in the dry season and during the rainy season. Road construction and maintenance should also be addressed. Note that GTZ is planning to improve the road between Koumbia and Diebougou. Also, mention was made of possible work to begin on the Bobo-Dedougou road.

### **National Forest or Unclassified Forest Lands (*domaine protégé*)**

National forests should be given priority for management given that they are already recognized by the government and the population as belonging to the government. Tenure issues are almost nonexistent in these forests until legally recognized management plans are developed that define exploitation rights of local user groups. Furthermore, forest management in national forests with local participation has already been recognized by the GOBF as a valid approach due to the positive results in the Nazinon forest. Although similar efforts are underway to manage community forests in the *domaine protégé* outside of the national forests, local user groups have not yet been given exclusive exploitation rights in these forests.

Each national forest within 100 kilometers from Bobo will require a separate study to determine the amount of the forest that has been taken over by farmers. The *schéma directeur* should make specific recommendations for each of these forests. Some of the options to consider are:

- Declassifying the entire forest;
- Declassifying part of the forest;
- Regrouping the occupants within an enclave of the forest; and
- Resettling occupants outside of the forest.

The *schéma* should also make recommendations for gazetting large forest areas that are now classed as *domaine protégé*. Although many such proposals have been put forth in the past, few, if any, have been officially accepted.

Note that the World Bank has proposed to intervene in five national forests to implement PNGTV/natural-forest-management-type activities. The forests selected for intervention are Maro, Mare aux Hippos, and three forests in the *massif de Bougouriba*. It is not clear by what criteria the Bank made the final selection. It is felt that the Mou forest of 50,000 hectare should remain a priority given the level of uncontrolled activities such as farming, livestock, woodcutting, and hunting. It is recommended that the Mou Forest be reconsidered for management by the Bank as an additional site or in lieu of one of the forests in the Bougouriba massif.

Given the richness of wildlife in the Mou and the surrounding area (Nabere Reserve and adjacent land), it is also suggested that this entire massif be considered as a potential new National Park. This could be further investigated by ADEFA using the computer model that is discussed below.



### **Local Participation**

The extent to which local villagers are willing to participate in *gestion terroir* programs is an important criteria but will remain difficult to determine until the programs are initiated. However, priority should be given to villages and *terroirs* that have already participated in the micro land use planning exercise (zonage) as developed by the AMV projects and PNGTV pilot projects. For example, at Sebedougou and Kimi in the Houet Province, forest and pastoral areas have already been demarcated on maps. Such villages should be given a high priority for management interventions. In fact, villages with demarcated community villages could be addressed from day one of the project to develop simple silvicultural prescriptions/management plans have them officially accepted (signed by the Haut Commissaire), and put into effect. Such villages could serve as models for other areas identified in the macroplanning exercise.

### **Sustainable Production and Marketing of Firewood and Other Forestry Products**

#### **Analysis of the Forestry Situation in the Area of Bobo**

In conjunction with the land use planning activity, a marketing specialist and a financial control/organizational expert will be hired for a period of three months to produce a detailed overview of the firewood marketing system in Bobo as well as other potential forest product markets. This study will produce a detailed document with specific recommendations to improve the management, exploitation, commercialization, and control of the firewood industry in Bobo. The consultants will work in close collaboration with the proposed World Bank forestry project, the FAO forestry project at Nazinon, and the *Service Exploitation et Protection (MET)* and *Union des Exploitants du Bois et de Charbon (UNEBOC)*. the study will address the following subjects:

- Supply and demand of firewood;
- The firewood cutting permit system;
- Monitoring/control and compliance with the permit system;
- Financial management; and
- Potential markets of other primary and secondary forest products;

#### **Firewood Supply and Demand**

Demand will be based upon the best available population projections and annual per capita firewood consumption figures taken from the World Bank ESMAP report of September 1990. Supply will be estimated from the best available production/growth data using earlier inventory methodologies and estimated growth figures for different forest types.

### **Woodcutting Permit System**

The study will review the present wood cutting permit system and recommend how this system could be improved to assure that woodcutters are systematically directed to forests that have approved forest management plans. This problem can only be addressed over a period of time as more forests are subjected to management and more local *groupements* are officially recognized. The long-term goal, however, is that all firewood coming into Bobo be taken only from managed forests. Such forests include national forests and smaller, community-managed forests within a *terroir*.

The price of the permits will also be reviewed. Although the official price of firewood is 1,610 FCFA for Ouaga and Koudougou, it is not clear whether the official price of 1,210 FCFA for Bobo has been accepted or put into effect. What is a fair price for Bobo, which assures that all parties receive an equitable share of the benefits? How does one guarantee that part of the benefits will be reinvested in the forest to pay for the recurrent costs of management? There is a need to reassess pricing policies and the necessary measures needed to put such policies into effect.

### **Control**

The study will also review the present system of control with respect to cutting and the entry of firewood into Bobo. Issues to target are availability of personnel, availability of vehicles and equipment, and the organization and administration of the control system.

In addition, the study will review the present and future role of villagers in woodcutting control. One proposal put forth for consideration is that cutting permits issued from Bobo would designate the name of a particular *groupement* responsible for overseeing the woodcutting in a national or community forest. Wood merchants would buy authorized permits from the Forest Service in Bobo and be required to obtain an additional counter signature at the local level to prove that the conditions of the permit had been fulfilled with respect to species, quantity, and locality.

Another option to consider is that MET issue the *permis de transport* and the village issue the *permis de coupe*.

### **Financial Management**

Financial management procedures will be reviewed and recommendations put forth accordingly. The fundamental issue to be resolved with respect to financial management is the *fonds d'aménagement*, which is a special fund to be reinvested into the forest to cover recurrent costs of management. Such a fund has been created at Nazinon and Toumousseni making Burkina Faso one of the few countries in Africa in which proceeds generated from forestry enterprises are reinvested back in the forest. At Nazinon and Toumousseni, the fund is controlled and managed by existing projects. What happens to the fund when the project terminates?

The administration of this fund was one of the main issues discussed during the recent FAO/Forestry, Trees and People seminar that took place in Ouagadougou in May 1990. Most of the participants agreed that the fund could not be administered directly by the ministry. The workshop concluded that such funds should be administered at the local level either by *groupements* or cooperatives officially recognized by the government. The role of the forest agent would be to work with the local cooperative to assure that the fund is being properly reinvested into the forest based on a predetermined

management prescription and an annual budget established by the cooperative and aided by qualified forest technicians. The FAO project at Nazinon has put forth a proposal that adheres to the recommendation of the workshop that local *groupements* control the fund. Whether the GOBF will accept it or not is unclear.

### **Potential Markets of Other Wood Products and Secondary Forest Products**

Forest management can be justified by governments as long as there is an economic incentive for the local people and the government. Forests must begin to pay for themselves. At present, firewood (at Nazinon) and wildlife (at Nazinga) are the only two forestry activities that are being exploited on a sustainable basis. There is a need to diversify and explore other potential primary and secondary industries. These include:

#### **Sawtimber/parquet**

There are two sawmills at Banfora that continue to operate. In spite of reports that many of the forests in the Houet and Comoe Provinces have been highgraded for sawlogs, it is not clear to what extent this is true. No inventories have been carried out to quantify remaining sawtimber quality stands. In addition to large logs for timber, a separate study should be conducted with regard to parquet production for hardwood floors. There is apparently a large market for parquet in Europe which should not be overlooked. This would require some investigation into preferred species, transportation costs to Abidjan, and so forth.

#### **Feasibility study on potential for producing electricity with biomass-fired generators**

Although the Action Plan Team has little experience in this domain, it is felt that the generation of electricity with wood fired turbines should not be overlooked. The conversion from gas to wood in many smaller cities in the United States is currently taking place. Given the huge amount of standing biomass in the Comoe Province, the relatively quick rotation period of tropical forests compared to temperate forests, the railroad that runs through Bobo, and the high cost of generating electricity in Bobo with imported nonrenewable petroleum products, it seems that the feasibility of generating electricity with biomass should be addressed.

Winrock Inc. is involved in the Biomass Energy Systems Technology Project (BEST) funded by AID/S&T. This project could provide technical assistance to conduct a preliminary study. Such a study should include an estimate of biomass production and growth rates from forests around Bobo and in the Comoe Province. In addition, it will be necessary to determine present and future needs of electricity in the Houet and surround provinces. Needless to say, if such an operation is feasible, the implications are far-reaching in terms of market demand for forest products, employment, forest management and utilization, and improved balance of trade for the GOBF.

#### **Game Ranching/Hunting**

ADEFA has recently developed a computer model to determine the economic feasibility of Nazinga-type operations based on wildlife population, rate of offtake, and so forth. This model could be applied to the national forests around Bobo and the Comoe/Leraba proposed park.

It has been suggested that the Mou Forest (50,000 hectares) the Reserve of Nabere (36,500 hectares) and adjacent areas that support wildlife could be considered for a game ranching and hunting reserve. This should be further investigated by ADEFA. Note that the Action Plan Team was informed at Diebougou that GTZ has just finished a study of forestry issues in the area. A copy of this study should be obtained from GTZ and added to the documentation at USAID.

### **Secondary Forest Product Market in Bobo**

Based on results at the Toumousseni forest near Banfora and earlier studies carried out at the Dinderesso Forest near Bobo, secondary forest products such as honey, karite, and medicine offer other important opportunities for the forest manager. The study should analyze the secondary forest product market in Bobo in real economic terms and develop a strategy to address this important sector.

### **Elaboration of the *Schéma Directeur***

The entire land use planning exercise will be overseen by a full time rural development/extension specialist in collaboration with the CRPA and the Regional Direction of the Forest Service at Bobo. This exercise will draw upon local expertise and benefit from the assistance of the forest manager, the credit specialist, and a short term specialist in aerial photo interpretation/land use planning who will be hired for the entire three-month period.

The firewood market/permit system study will be carried out by a short-term (three months) marketing/financial control specialist.

The end result of this exercise will be a series of 1:200,000 land use planning maps demarcating forest areas with the highest potential for management interventions based on the criteria as discussed above. In addition, a document will be written to present an overview of the forestry/firewood situation in Bobo in terms of supply and demand. The *schéma directeur* document should also offer short-, medium- and long-term strategies to address natural forest management within the 100-kilometers radius. It will also provide a means to link village-based NRM activities carried out within the *terroir* to address deforestation and promote integrated, sustainable land use.

Based on results of the land use planning exercise, the project will focus on priority areas to initiate gestion *terroir* programs with villages in the proximity of targeted forests.

### ***Zonage Villageois* of Agricultural, Forestry and Pastoral Areas Within The Terroir**

Once the *zonage* is completed, the project team will initiate discussions with villagers to address natural resource problems on the farm, within the forest and within the pastoral zone. These discussions will lead to the development of prescribed technical options and eventually management prescriptions which will be formally adopted in the form of a policy statement or contract.

## Forestry Management

Once the forest area has been delineated on a map, in a National forest or a community forest, the forest manager will initiate the development of a forest management plan. Given the amount of experience and literature (FAO, NRMS, Nazinon, Niger) that exists on techniques and approaches to manage natural forests, this document will not delve into technical details. There are, however, several issues that should be addressed in the Project Agreement (see problem analysis section on forest management).

The cutting of live trees remains an issue in Burkina Faso. At Nazinon, the project is authorized to cut live trees based upon an approved cutting plan. At Koudougou, however, the cutting of live trees has not yet been authorized. The cutting of live trees is fundamental to successful forest management. The Project Agreement should contain language to the effect that the cutting of live trees will be authorized once a management plan/silvicultural prescription has been approved at the Provincial level.

It should be recognized that most of the experiences to date in the field of forest management are based on work carried out in national forests, and little has been done with respect to managing ungazetted community forests. The FAO project in the area of Kassou (south of Ouaga) has begun to address community forest management in ungazetted areas. Also, in Niger, CARE is working in the terroir of Baban Rafi outside of Maradi. Both of these projects will serve as model approaches for future interventions at the level of the terroir.

## Livestock Management

"Without the cooperation of the herders, your project will fail." (Père Terrible, Bobo Dioulasso)

Although several of the *terroirs* that were visited by the team had delineated pastoral zones, little was actually being done to control the number of animals within these zones. At Mogtedo, however, some of the villages within the *terroir* had negotiated agreements with local herders to supply them with manure in exchange for certain grazing rights. In addition, dialogue had begun to address stocking rates for certain areas within the *terroir* with local fulani herders. In general, agents and villagers involved in *terroir* projects admitted that there have been problems with herders and that there is a need for guidance from qualified livestock people.

In addition to range management, the growing of fodder crops to supplement herds during the dry season has shown positive results and seems to be accepted more and more by villagers and herders as an appropriate, worthwhile endeavor. This should be followed up by the project, perhaps in collaboration with the ARTS research station outside of Bobo. It was observed by the team that many of the species being tested are not native to Burkina Faso such as *vetiver* and lab-lab. These tests should be complemented with work on some of the valuable indigenous forage species such as *Combretum aculeatum*, *Commiphora africana*, and others that may have been grazed out of an area but could be better adapted to a particular ecosystem than species brought in from the outside. Information about valuable forage species that have been grazed out of an area can be had with local herders.

Other approaches and activities that could be put forth as options to consider by the village committee could include:

- Grazing contracts with local herders;

- **Grazing contracts with herders from outside the terroir;**
- **Range improvement;**
- **Creation and control of water points;**
- **Village run dispensary units to sell certain medicines; and**
- **School literacy classes.**

In any case, livestock management within the *terroir* will require that the project establish an effective livestock extension unit to open avenues of communication with local herders and from herders that frequent a particular pasture during certain periods of the year. Herders will also need support to increase their participation and negotiating position in the development of village land use plans and resource management plans. Training of extension agents should be addressed early in the project. Agents should not, however, enter *terroirs* with fixed technical packages as prescribed by the livestock service or assume that because a certain technique works in Zorgho, it can be replicated in Bobo.

#### **NATURAL RESOURCE MANAGEMENT AND CONSERVATION OF NATURE: COMOE/LERABA**

The other major component of the project will focus on natural resource management and conservation in the Comoe Provinces.

Given the large area involved, the nature of the problem, and the absolute necessity for coordination among Swedish, UNDP/UNSO, Canada, IUCN and other organizations that have shown interest in the area, it is not clear how the problems of the area should be addressed. What is clear, however, is that this area is one of the richest remaining natural areas in Burkina Faso and that steps should be taken to reverse the ongoing clearing of the forests for agriculture and poaching that currently threatens these forests.

#### **Strategy in Comoe**

It is recommended that a two-person team consisting of a wildlife management/park specialist and a livestock/social anthropologist expert be fielded as soon as possible to:

- **Review Comoe/Leraba project;**
- **Spend at least two weeks in the field to visit Sideragdougou livestock project, Toumousseni, proposed pastoral sites, forestry post at Folonzo and discuss with local authorities;**
- **Coordinate game ranching/wildlife study with the Association pour le Développement de l'Exploitation de la Faune Aménagée (ADEFA);**
- **Meet with MAE, MET, IUCN, IDA, UNSO, UNDP, UNSO, ADEFA, Canadians and other agencies interested in the area; and**

- **Develop a short, medium- and long-term strategy to address the area and develop a five year workplan and budget for this component of the project.**

### **Général Approach to Consider**

In the short term, assistance should be directed to supporting GOBF efforts to control immigration and poaching, which are two major problems in the area. The GOBF has budgeted 12 million FCFA to construct and maintain forest roads, mobilize forest guards, and support the forest post at Folonzo located on the northern boundary of the national forest of Diefoula. This is a start and should be supported, but the team was told that similar efforts of heavy-handed control carried out in the Poni Province did little more than alienate the population. Control is necessary but it must be accompanied by extension and information campaigns to inform the population of the benefits and objectives of the campaign. Perhaps visits to Nazinga and Nazinon could be arranged.

Also, in the short term, the project should develop a *schéma directeur* for the area. The *schéma* should include a section on the nature of the problem in the Comoe and how the project will address the situation in the short, medium and long term.

The *schéma* should include a macrolevel land use plan similar to that described above for the area of Bobo, and supported by necessary studies as identified in the project document. Although it is envisaged that the two main opportunities for development in this area are wildlife and livestock, this does not imply that agriculture be excluded. The plan should identify the best areas for agriculture, pasture, forestry, and wildlife/parks. Once the *schéma* has been adopted, the project will aid the GOBF to make it operational.

USAID's likely areas of intervention are support to Comoe/Leraba National Park using a Nazinga/ADEFA-type approach, and livestock management in one or both of the proposed zones pastorals.

The big issue that must be discussed and agreed upon before the project begins is tenure. Is the GOBF willing to let local user groups manage their own resources using a contract/*cahier de charge* approach? Based on what has happened at Nazinga and what is happening in some of the pastoral zones and community forests within the *terroirs*, one can only conclude that tenure and decentralization remain the two biggest stumbling blocks to locally controlled natural resource management activities.

## **CHAPTER THREE**

### **ORIENTATION FOR MANAGEMENT OF VILLAGE LANDS**

#### **PROBLEM ANALYSIS**

##### **Target of the GTV Component<sup>1</sup>**

The target is to assist members of each participating terroir to achieve sustainable increases in yields and income through better management of natural resources. In this context, management of natural resources includes agricultural, forestry, and livestock activities within the *terroir*. Major purposes of this component are to stabilize the areas of annual crop production by increasing agricultural productivity, and to generate sufficient return from management of forestry and range lands that a portion of that return can be reinvested in those lands.

A guiding premise is that it is not necessary to wait for technological breakthrough to make significant progress toward this target. To the contrary, waiting for breakthroughs before taking aggressive action will raise the price many times for achieving the target.

##### **Constraints**

The hierarchically ordered constraints that hinder achieving this target are:

- Lack of knowledge and use of practices to conserve soil fertility at the terroir level; and
- Lack of appropriate management of forest and range resources.
- Lack of appropriate incentives for farmers, herders, and woodcutters to adopt appropriate practices. Incentive conditions include:
  - Right to harvest benefits of better management;
  - Reduction in financial risk associated with the adoption of improved practices; and
  - Access to knowledge of improved practices.

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<sup>1</sup> Gestion de Terroirs Villagois (GTV).



### **Addressing the Constraints: Establishing Conditions That Increase the Incentive to Adopt Better Practices**

In the end, collective efforts of the local group members will overcome constraints to reaching targeted goals. This component of the project will support village groups by establishing the following appropriate conditions:

- Protecting the right to the products of better management through appropriate interpretation of the RAF;
- Strengthening the capacity of Village organizations to manage NRM enterprises, to seek assistance, and to negotiate with the State and others; and
- Broadening access to knowledge about practices and systems.

### **ESTABLISHING CONDITIONS TO ENCOURAGE WIDER DIFFUSION OF APPROPRIATE NRM PRACTICES**

NRM assessments in the Sahel have identified a wide array of existing knowledge and practices that show promise in addressing the natural resource constraints for the short, medium, and long term. Wider diffusion of these practices would have significant impact on achieving the target. This premise, however, does not discount the need to support research for new technologies.

This project focuses on establishing conditions that increase the incentive for diffusion of appropriate practices.

#### **The Conditions**

##### **Rights to the Products of Better Management**

Before *groupements* members can be expected to make the necessary investments in their lands, they need security over expected harvests, especially for long-term access. Toward providing greater land tenure security, the GOBF has put forth the RAF. However, interpretation of the RAF and its implementation at the *terroir* level are still being worked out. The project will assist in developing interpretations to reward those who take better care of natural resource endowments.

##### **Strengthening the Organizational Capacity of Village Groups**

The second element of this project component will strengthen the capacity of participating groups to manage NRM-based activities within the *terroir*. For example, better management of natural resources requires better management of NRM-based enterprises, including access to markets and credit. More effective enterprises also produce the additional benefit streams necessary for investment back into the land. Moreover, a strengthened organizational capacity should also assist the group to negotiate better

concerning relevant policy issues such as the RAF, and to negotiate assistance from various agencies and organizations.

#### **Wider Access to Knowledge About Better Practices**

In Burkina Faso as well as across the Sahel, the natural resources constraints facing the farmers, herders, and woodcutters are being addressed in a variety of ways. Many of these technologies hold promise for *groupements* in the project area. The third element of this project component will help members to make informed choices about the adoption of a wider array of practices and provide timely technical assistance in the adoption of those practices.

### **Principles of the Approach**

#### **Build on Existing Experience**

As noted, there is much experience in addressing natural resource constraints. Wherever possible, the project will capitalize on this experience.

#### **Shared Ownership of Knowledge and Process**

Given that much experience does exist upon which to build, knowledge of those experiences needs to be shared by GOBF officials, *groupement* members and USAID personnel. In implementing the project, trips to sites where the target has been achieved will be supported.

#### **Local Focus**

During the Concepts Team's field trips, the message was quite clear that the closer to the *terroir*, the better the understanding of the problem. For example, with respect to RAF, *groupements* have a better appreciation of the issues than Provincial-level personnel, and Provincial-level personnel have better understanding than those at the national level. Lessons learned through this project should inform policy and institutional reforms at both provincial and national levels.

### **Cross-cutting Issues**

There are a number of issues that project design and implementation need to address.

#### **Diversification of Economy at the *Groupement* Level**

Sustainable economic growth for the *terroir* (and for the region) is doubtful unless there is economic diversification. As a priority, the cotton-based economy needs to be diversified and expanded.

### **Stabilization of Production Units**

If the natural resources base is to be managed for sustainable growth, land area under annual crop production will have to be stabilized through higher productivity. The conditions to be established under the project are aimed at increasing productivity through encouraging greater investments in the land.

### **Integration of Agricultural, Forestry and Livestock Activities**

Sustainable economic development within the *terroir* depends upon integration of agricultural, forestry, and livestock activities. Soil fertility depends upon livestock for manure and the power to turn under crop residue; equally, agroforestry improves both soil fertility and soil conservation; livestock depend upon crop and forest residues for forage; and, in the long run, one of the most important factors in maintaining forestry resources is to stabilize annual crop production systems.

### **Coordination with the ARTS Project<sup>2</sup>**

The ARTS project is addressing many of the constraints to wider diffusion of better agricultural practices through support to relevant GOBF institutions. During design of the NRM project, the issue of how this project will complement activities of the ARTS project will have to be addressed.

### **Coordination with Other Programs**

The PNGTV and other GOBF programs have developed an institutional framework in which the NRM Project will work. The relation of the NRM project to these programs will need to be studied and defined.

## **IMPLEMENTING THE ELEMENTS**

Implementation of project elements can take place concurrently, but needs to be coordinated.

### **Strengthening Local *Groupements***

The objective of developing stronger *groupements* includes better management capability for NRM-based enterprises, and increased capacity to negotiate terms of the RAF and to implement those terms. Therefore this element of the project should be managed by an organization with a proven track record. CLUSA is used as the illustrative case here.

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<sup>2</sup> This and the next point are both design and implementation issues.

## **Actions Under This Element**

### **Selection of Sites**

To make the selection, a team composed of the managing organization (CLUSA), CRPA, MET, and the land use planner will make surveys of candidate *terroirs*. Priority should be given to those *terroirs* that meet the following criteria:

- Experience in negotiating the delimitation and management of zones within the *terroir*;
- Sufficient forestry resources to justify development and implementation of a forestry management plan;
- An agriculture-based economy (cotton, karite, groundnuts) that produces a sufficient benefit stream to permit a portion that can be reinvested back in the land; and
- Integration of livestock and agriculture, with some use of animal traction, and an animal population sufficient to produce substantial quantities of manure.

### **Site Visits**

Various *groupements* in Burkina Faso, Niger, and Mali have made impressive progress in managing-based enterprises. Several of these sites should be visited to help village group leaders and project personnel (both GOBF and USAID) develop more concrete perspectives about the manifold potential benefits of village group organizations.

### **Zonage Within the *Terroir* According to NRM Criteria**

Under the PNGTV, *terroirs* have been zoned for agriculture, pasture, and forest. All else being equal, these categories should be maintained. If the project is working with a village that has been zoned, specialists from the MET, CRPA, and the project (land use planner) should review the feasibility of the zoning. Once the zones have been identified, the Land Use Planning Team (LUP) works with a MET specialist to develop a management plan for the forestry zone and with the MAE specialists to develop management plans for the agriculture and pasture zones. (Note: Development of these plans includes technical site visits for project and *groupement* personnel to areas where plans have been implemented. These visits could be one and the same with the *groupement* visits specified above.)

### **Implementation of the Management Plans**

Management plans will be implemented for each zone. Suggested approach for each zone is in Annex Three.

### **Managing NRM Enterprises**

CLUSA or a similar organization will assist the *groupement* to develop and operate NRM-based enterprises. This training will assist *groupements* to strengthen their capacity to get loans from private institutions. (The CLUSA work in Niger and Mali in *groupement* enterprise development is the model for this action. Possible trip would include visits to the OHV zone in Mali where *Association Villageoises* (AV) have been able to procure loans from the bank).

A component of better enterprise management may include establishment of trade relations with villages in other parts of Burkina Faso. For example, the 6S is helping villages in the southwest send fruit to villages in the Central Plateau in return for small ruminants.

### **Outputs**

Strengthening the capacity of local organizations is expected to establish the following outputs:

- Access to new sources of credit (other than those linked to cotton production);
- Strengthened capacity to manage NRM-based enterprises, and to have access to markets;
- Capacity to negotiate in the interpretation of the RAF as it applies to management of the terroir;
- Improved management of forest and range resources;
- Appropriately managed portions of benefit streams reinvested into the natural resources base;
- Relationships established with sister villages in other agroecological zones in Burkina Faso that favor increases in commodity trading; and
- Increased capacity to seek outside technical or material assistance, and to negotiate use of matching-type assistance.

The last output will be critical to the achievement of the goal. As will be seen in Annex 3, diffusion of technologies that have long-term impacts often require short-term material assistance to reduce risk to the smallholders adopting the practice. A well-organized *groupement* would be in better position to negotiate with GOBF or NGO organizations that require some form of local commitment and investment before sharing the costs.

### **Strengthening Security Over Products of Better Management**

This element focuses on the implementation of the RAF at *terroir* level. While progress has been made in developing the RAF, matters of its interpretation are still in question. There are, however, various experiences in its interpretation that should be examined.

To help establish language that would be a condition-precedent for USAID's support, it is suggested that the Project engage the Land Tenure Center to work with GOBF officials in developing language for implementation at the *Terroir* level. The LTC can also help generate methods which will extend lessons learned from the project.

It is necessary at this point to note that in the context of this project, the RAF is seen as a tool to improve management of natural resources. Thus, the question that needs to be posed throughout the development of the language is "how will this particular interpretation encourage better management of natural resources?"

## **Actions**

### **Developing Appropriate Language**

An LTC specialist is engaged on a short-term basis for a series of meetings and site visits with appropriate GOBF counterparts. It is recommended that the Mission capitalize on the LTC experience in Niger in conducting dialogue with GOBF officials to develop language for localized use rights. These use rights were developed in the context of the Agricultural Sector Development Grant II. (A copy of the Grant Agreement and the conditions precedent is in the library.)

### **Developing Tenure-Based Conditions-Precedent**

Once appropriate language has been developed, it becomes a condition-precedent (CP) for USAID's participation. (Note: Where USAID participates, at least two conditions are suggested:

- There will be a management plan developed and implemented for the *terroir*, and
- The members of the *groupement* receive the benefits of implementing the management plan.

### **Increasing Access to Knowledge of Appropriate Practices**

The above two elements of this component contribute to a diffusion of practices by increasing security over products of better management, and by strengthening local capacities to deal with financial and political factors involved with improving management of natural resources. This element focuses on assisting *groupement* members to make informed decisions about adoption of practices, and provide timely technical assistance.

The farming systems specialist and counterpart will be responsible for coordinating action here. Much use will be made of locally available technical expertise where available. Portions of this element could be supported by the NRMS project prior to or during the beginning of the project. In particular the proposed site visits to other Sahelian countries is an appropriate NRMS project activity.

**Actions**

Action under this element include the following:

- Visits by *groupement* and project personnel to sites of promising practices;
- Farm days, and establishment of contact by *groupements* to ensure continued and regular exchanges of experience;
- Mass media diffusion of information on promising practices (and the conditions that contribute to the adoption of those practices);
- Special training for *groupement* leaders in diffusion of sustainable agricultural techniques and alphabetization;
- Training of CRPA and MET agents in extension techniques (including GRAAP methodology); and
- Assistance to *groupements* in identifying agencies, NGOs and other institutions that provide regular technical assistance at the *terroir* level.

**Outputs of Diffusion Element**

- *Groupement* members will have wider first-hand knowledge of appropriate technologies;
- *Groupements* will have additional ways and means to gain first-hand knowledge about better practices; and
- There will be better integration of agricultural, forestry and livestock activities at the *terroir* level.

## CHAPTER FOUR

### FARMING SYSTEMS AND VILLAGE-LEVEL INTERVENTIONS

The goal of village or *terroir* natural resource management is to sustain higher income and yields through better management of the natural resources at the disposal of farms and *terroir* communities in southwest Burkina Faso. The basic unit for evaluation of higher income will be in CFA francs, but may also be in livestock or other investments made with income. Higher crop yields will be measured in kg/ha, while higher wood and livestock production will be measured in appropriate units.

#### PROJECT AREA

The focus of this phase of the natural resources management project has been southwest Burkina Faso. Three provinces form the extreme southwest portion of the country, including Comoe, Houet, and Kenedougou. The three provinces are in the same eco-climatic zone, southern sudan, and agroclimatic zone, guinea savanna. Although no part of the three provinces lies outside of these zones, wide variation in rainfall, vegetation, and soils is found. Cropping patterns vary with yams and cereals in Comoe, cereals, cotton and groundnuts in Houet, and cereals, groundnuts, fruit trees and cotton in Kenedougou. Sesame is cultivated in both Houet and Kenedougou. Forested areas are more expansive in Comoe, both within *terroirs* and in protected areas, than in either Houet or Kenedougou. Relatively more arable land is found in *terroirs* of Houet and Kenedougou than in Comoe.

Table 1 shows that variation in surface area (km<sup>2</sup>) and population density exists among the three provinces of the southwest area of the country. Kenedougou has the smaller land area and still relatively low population density (16.5 persons/km<sup>2</sup>). Migration has begun into the province, however (conversations with extension personnel Hauts Bassins-CRPA), and villagers have noticed an influx of Peulh herders and Mossi from the Central Plateau. Houet province has the greatest population density (35.3 persons/km<sup>2</sup>) among the three provinces. Houet lies on the direct migration path from the Central Plateau to the southern areas of the country and consequently has had greater pressure on existing land resources. Comoe, with the larger total land area, much of it forested, has the least population density with an average of 13.6 persons/km<sup>2</sup>. Land pressure is not only a function of population density but also of the production potential of the natural resources on the land and how those resources are managed.



Table 1. Land area and population in southwest Burkina Faso

Province	Surface area(km <sup>2</sup> )	Population	Population density (persons/km <sup>2</sup> )
Kenedougou	8,507	139,973	16.5
Houet	16,472	581,722	35.3
Comoe	18,393	249,967	13.6

Source: Recensement de 1985, as quoted by Secretariat d'Etat a l'Elevage, 1990a:9-10.

Kenedougou and Houet are the provinces covered by the CRPA-Hauts Bassins extension service. The CRPA-Comoe extension service includes only the one province. Both are part of regional planning meetings (CRPA-Region Ouest) and participate together in an annual research and extension meeting where results of the past agricultural season and planning for the coming season are discussed. This planning is part of regionalization efforts of GOBF in both research (MESRES/INERA) and agricultural extension (MAE/CRPA). The Ministry of Plan, aided by the World Bank, has also adopted a regional approach to development that includes dividing the country into 10 planning regions of which the three provinces, Houet, Kenedougou, and Comoe, form planning region 9.

Although much variation exists between and within provinces of the southwest, the general project target location for *terroir*-level interventions should include the three provinces of Houet, Kenedougou and Comoe. Enterprise streams to be developed by Village Land Management Committees (VLMC) and project personnel will certainly be different depending on the exploitable natural resource base, land pressure, and access to markets and credit. These factors vary from province to province, but project approaches to sustainable natural resource management at the *terroir* level should not be limited to a single resource. Overall budget constraints will indicate how much of this area will be covered by the project, and priority areas within the southwest to target at any one stage of the project's life. Enterprise streams that 1) are profitable to villagers, 2) are capable of coalescing the zoning of the *terroir* and supporting the establishment of broad-based VLMCs, and 3) result in sustainable natural resources management practices are possible in all three provinces of the southwest. No further limitation of the project area of implementation is useful at this point.

Development activities spearheaded by various GOBF ministries, donor participation and projects either in the implementation or planning stages vary among the three provinces. In some areas the NRM project will 'buy' into existing projects (such as the World Bank VLM project being planned in Kenedougou and the Caisse Centrale project being implemented in Houet). The buy-in will consist of determining which areas the USAID NRM project can assist and for which activities in these areas the project will assume responsibility within the overall scope of work. In other instances the project will add onto existing project activities by addressing natural resources at the *terroir* level that were not as yet targeted by these projects (such as *terroir* forest and range management plans in PNGTV pilot projects. Finally, in some areas, such as Comoe, the USAID NRM project will be the first to intervene within the extension service, with a village (*terroir*) approach to natural resources management.

## CURRENT SITUATION: OVERVIEW OF NATURAL RESOURCE MANAGEMENT IN TERROIRS OF THE SOUTHWEST

The natural resource base in village *terroirs* of southwest Burkina Faso consists of cropland, fallow, pasture and range resources, and forested areas. Relative proportions of these resources vary from one *terroir* to the next, from Department to Department and from Province to Province. Management constraints show variation as well, depending on land pressure, soils, rainfall (intensity and total precipitation), natural vegetation, and livestock numbers (and types). The resource managers in any one *terroir*, consisting of agriculturalists, herders and woodcutters, come from various ethnic and occupational backgrounds, which add to overall natural resources management variation in the project area.

### Cropland (and Fallow) Resources

Traditional management systems for agricultural lands in the southwest employed a sequence involving landclearing, cropping, and leaving the land fallow to rejuvenate lost fertility (during the cropping period) and conserve the soil resource with natural vegetation. Village *chefs de terre* determined when land in fallow could be cleared to begin the cropping sequence again. Villages remained generally stable if water remained available for human and livestock needs. As long as land and population pressure was not great, the traditional system sustained the natural resource base while providing the village with its food needs.

Traditional farming groups, occupying *terroirs* of the southwest, have no tradition of large ruminant (cattle) management within the *terroir*, but small ruminants (goats and sheep) have historically been part of farming systems in the area. This specificity of occupations between farming groups, cattle herders, and fishermen in Sahelian and savanna zones of West Africa has undermined assumptions held by development institutions that did not take them into consideration in project planning.

For example, these factors were seriously underestimated (or not considered at all) in the planning and implementation of irrigation projects along the Senegal River. Major interaction traditionally occurred between farmers and herders during and after the recession of the floodwaters (*décrue*). Sorghum had been cultivated on the residual moisture of river overflow (called *walo* in Mauritania). When this water was controlled for irrigation, the symbiotic system based on *walo* cultures came to an abrupt halt. But the *walo* system had accounted for the greater part of sorghum production in Mauritania, using manure fertilization from the transhumant cattle; and the herds that spent six months in the area no longer had access to water and forage.

In the southwest, transhumant cattle herds pass through farming communities soon after sorghum harvest. Cattle in the herds graze cereal stubble in the fields, leaving their droppings in exchange for the forage. Watering points in nearby forests mean that food and water are available for six weeks or so before the herders continue to more southern points. This interaction with herder groups has been the only help farmers have had for fertilizing the fields farther from habitation. Close-in fields have usually received all the refuse from the household, making them stable and permanent. New fields were usually cleared and far-off fields left to fallow when soil fertility was drained.

A combination of factors has caused problems for sustainability of the relationship between occupational groups, and natural resources utilization in the three provinces of the project area. Drought and desertification of traditional range in northern areas of the country have brought herders further south in search of range and water. The other factor impacting natural resources in *terroirs* is the migration of Mossi from the Central Plateau into the southwest. The influx of the two migratory groups, one essentially herder and the other farmer, has begun to place great pressure on land resources within the *terroirs*. The pressure on land has made demands on soil fertility that traditional practices, including interactions between occupational groups, no longer can sustain.

In conditions that are optimal for pasture (access to water) in the southwest, three herder groups can be found. Some Peulhs have become sedentarized and maintain their herds within the *terroir* on a year-round basis. They cultivate cereal for their domestic needs in areas where cattle have been in corrals during the year near their habitation, apart from the village structure of indigenous farming groups. Other Peulhs have become semi-sedentarized. They normally have year-round habitation in a *terroir*, but their herds move in large areas around the *terroir* in which they live. The movement allows cattle access to pasture and water at natural points within the watershed.

The third is the traditional transhumant group that passes through the *terroir* after harvest and uses range resources in addition to cereal stubble. Very clear association and communication occurs between the three Peulh groups and they are known to help one another in finding necessary range and water for livestock herds. One of the *terroirs* that can be considered optimal for the three herder groups is the PNGTV-Hauts Bassins test village of Koura. Koura is situated just on the edge of the protected forest of Tui in the Department of Bereba. Peulh groups account for 45 percent, autochthonous Bwaba for 37 percent and immigrant Mossi for 19.5 percent of the total population (PNGTV-Hauts Bassins, 1989b). Cattle of Peulh groups in the *terroir* number 853 head, while Mossi had 11 head and Bwaba had 6 head (PNGTV-Hauts Bassins, 1989a). The numbers of cattle managed by Peulhs may be underestimated because of confidence problems between herders and project personnel. This is quite common where cattle are taxed per head and all government institutions are seen as potential rapporteurs of the taxable numbers by herders. The cattle managed by Peulh groups in the *terroir* have the run of the Tui forest during the dry season where pasture and permanent water supplies are found.<sup>1</sup> Since the forest extends into Mouhoun Province from Houet where Koura is located, the cattle have access to reserves in the two provinces.

In most of the southwest the traditional land management system is still being practiced with some modification. Migration, land pressure, and greater need for cash generation, however, have resulted in breaking down the viability of traditional land management in terms of maintaining a sustainable natural resource base within the *terroir*. The traditional fallow period has been critically reduced or eliminated, and land previously kept for range and forest (more marginal than for agricultural use) is being cleared for cropping. Soil fertility, and particularly the organic matter fraction, cannot be maintained, resulting in physical and chemical breakdown of the soil and leading to serious degradation of this resource.

Studies conducted by ORSTOM (1976) show a range of organic matter in soils of Southwest Burkina Faso (Meridian zone soil maps) from 1-3 percent, with an average closer to 1.5 percent. Pieri

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<sup>1</sup> Personal communication with Dr. Seydu Sanu.

(1989) shows that critical organic matter levels for a given soil are correlated directly with the clay + silt fraction. He shows that at long-term experimental sites in the southwest portion of the country, the clay + silt fraction in the topsoil (0-20 cm) was between 10 and 20 percent. Critical O.M. level for these soils was between 0.5 and 0.7 percent. In contrast, soils further north had clay + silt fractions of between 0 and 6 percent and consequently a critical O.M. level that was lower than in the southwest (Annex 1). Land clearing of more marginal lands for cultivation has resulted in serious erosion by wind and water of the soil resource. This has occurred in those areas of the *terroir* where land is being cleared on greater slopes (> 3%), and on soils with more variable and shallower arable depth (A and B horizons), before the impenetrable layer is encountered. Rapid loss of topsoil in marginal areas that have been cleared and cultivated is seriously impacting the sustainable nature of this resource.

The PNGTV-Hauts Bassins (1989b) made a study of the cropping systems practiced in two test villages, Kimi and Koura. Kimi, located in the Department of Karangasso-Vigue, was estimated to be of intermediate land pressure and has no potentially good soils for agriculture (class A). Only one autochthonous exploitation, Tiefa, is found in the village. Of 146 exploitations in the village, 96 are Mossi and 49 are other migrant groups. Of the Mossi exploitations, 39 (40 percent) have either a complete or incomplete animal traction unit. Fifteen (30 percent) of the other groups in the village have at least part of an animal traction unit. No significant difference in surface area cultivated per farm worker was observed between exploitations with or without animal traction within any of the groups in the *terroir*. The population per exploitation with animal traction was somewhat larger than the population per exploitation of manual farms. Some 485 hectares were cultivated, of which cotton on 135, sorghum on 228, millet on 67.5 and maize on 23 hectares. Other crops, including groundnut, were cultivated on the remaining 30.5 hectares. Cotton was cultivated on manual farms, presumably by borrowing or rental of animal traction for seed-bed preparation.

Koura is composed of Peulh, Bwaba, and Mossi. Of the three groups, animal traction (and cotton production) are practiced by the Bwaba and Mossi. The Peulh, with most of the cattle in the village, do not use it for animal traction. The Bwabas have 51 percent of their cultivated land in cotton production and 47 percent in cereals. The Mossi have 73 percent in cereals and 23 percent in cotton production. Ninety-eight percent of the land cultivated by Peulhs in the *terroir* is in cereal production. Livestock appears to be the major cash source for the latter group while cotton is the major source of cash for the Bwabas and Mossi. The average surface area cultivated per active farm worker is 0.6 hectare. This does not vary significantly between farms with animal traction and manual farms.

The above study points to a few characteristics of the project zone, (depending on the representativeness of the villages studied), that are worth noting:

- Incomplete or complete animal traction units may be found on somewhere between 25 and 45 percent of the farms;
- Farms with animal traction have the least experience with cattle management, and Peulhs, who have traditional experience with cattle, do not use it for animal traction purposes;
- Little integration of livestock and agriculture is currently being practiced, but will be the only way farms in the southwest will be able to stabilize fields for agriculture production;
- If animal traction farms are larger than manual farms this is due to larger families rather than more land being cultivated per farm worker; and

- Cotton is the primary revenue source for farming groups while livestock fulfills this function for the herder group.

A major constraint in cotton production in the project area has been observed. Although cotton is the major cash crop in the project zone (aside from tree-fruit in Kenedougou and groundnut in all three provinces), there is no extension agency for the crop. SOFITEX has a marketing mandate for cotton, but has no responsibility for extension. The sole exception to this is the extension and maintenance role that SOFITEX has on tractor farms where no other agency would be expected to assume this role.

The CNCA works through SOFITEX for agriculture credit repayment and is the only agricultural credit institution operating in the project area. Input credit for other crops is extended by the CNCA, if cotton is grown on the farm and can be used for its repayment. The CRPA has the mandate for extension for all crop-related enterprises except cotton. This means that within the CRPA mandate, no viable agricultural credit options exist, outside of cotton, which is not in their mandate.

The consequence of this set of conditions in southwest Burkina Faso is that no medium-to-long-range incorporation of cotton into sustainable cropping systems is being done. This results in short-range cash objectives being pursued on farms, with little regard for the sustainability of the natural resource base that is exploited to meet them.

The same is not true in Mali (CMDT and OHV), or in northern Cameroon (SODOCOTON). In these countries, and in Chad, cotton is part of integrated development projects. Cotton extension in these countries includes livestock health, rural infrastructure, other cereal crops (upland rice and maize in the CMDT zone), integration of livestock and agriculture, sustainable crop rotations, and credit — at least for short-term agricultural inputs. By-products such as cottonseed meal have returned to farms at prices that allow farmers to invest in livestock rations for their traction animals.

### Forest and Range Resources

The *trois luites* (three battles) campaign that is being enforced in Burkina Faso by MET and CRPA personnel in the field is a governmental response to degradation of natural resources in the country. Specifically, the *trois luites* check the cutting of live wood, bush-fires, and uncontrolled livestock movement. Neither of the first two battles refers to a management plan that envisions the production of live wood in forested areas, or planned and controlled early fires. Management plans for livestock are vigorously being implemented by the (CRPA) Service Provincial d'Elevage (SPE) and the Service Provincial de l'Agriculture (SPA) agents. Often enforcement does not take into account the necessary conditions to permit livestock practices to change. Consequently, diffusion constraints are obvious in the region. The lack of flexibility in the enforcement of the *trois luites*, and the absence of management plans for the first two, are impacting the southwest in ways that were not imagined when these environmental laws were passed. (Burkina Faso Natural Resources Management Assessment, 1990).

In *terroirs* of the southwest, range and forest resources are available. The lack of management plans and inflexible *trois luites* control program, have interacted to present serious degradation risks to these natural resources. The need for more arable land to cultivate and soil fertility constraints have resulted in fields being cleared in these rather marginal agricultural areas, and soil erosion loss is apparent (Annex 2). Trees are cut in the clearing process without particular reference to MET agents, although in some cases these officials are contacted when a field is in planning stages for clearing. Forestry

officials are contacted depending upon their proximity to the *terroir* and the relationship that has been established between the service and the village in the past.

Both range and forest resources, which are not clearly defined in most *terroirs* of the area, are used for pasture and watering points by sedentary and semi-sedentary groups in the *terroir* at various times of the year. Friction exists between the different groups concerning the use of pasture and water reserves.

Few existing organizational structures in the *terroirs* are functional enough to resolve land and resource usage frictions effectively. The present rural code (RAF) may not give a sense of security to village authorities for management of the natural resource base of the *terroir*. The problem of tenure security may be exacerbated when frictions arise as to use rights of uncultivated areas of *terroirs*. This is because the uncultivated areas were resources for the whole village, while cultivated land (also for the whole village) was more rigidly controlled because the indigenous population was primarily agriculturally oriented. In any case, the rural code is not enforced (World Bank, 1990a). This lack of security concerning tenure rights to village lands tends to undermine traditional authority in its management, without replacing it with a functional management authority.

Forests provide products for the community including honey, fuelwood (either fallen branches or live wood — not shown to forestry agents), poles, medicine and herbs, and so on). They also provide wild game for consumption and fauna with cultural and religious significance. Traditional ancestral burial grounds are located in forested areas of the *terroir*.

The carrying capacity of natural vegetation (judged on livestock nutritional needs as covered for an equivalent of one year) has been found to be directly related to the number of rainfall months of the year in agroclimatic zones of West Africa (Memento de l'Agrologue, Cooperation Francaise, 1980). A rule of thumb used by range managers in the sahel is that the number of hectares (of natural vegetation) needed to provide sufficient nutritional requirements for one Tropical Livestock Unit (equal to 250 kg live weight) is roughly equivalent to the number of dry months in the year.

In the project zone, the number of dry months vary from five in Comoe, to six in northern parts of Kenedougou and Houet (ICRISAT, 1984). Thus the carrying capacity of natural vegetation in the project zone can be estimated to be from 5-6 hectares per TLU (*unité de bétail tropical* or UBT). Improved management of range areas with available practices and technology, may reduce the number of hectares needed to support one TLU in the Sikasso Area of Mali, to 3 ha/TLU.<sup>2</sup>

Range studies in the Sahel (Dutch Project) have shown that phosphorus is a major limiting factor to increases in range potential from the Sahelian to the guinea savanna agroecological zones of the region. They found that although total biomass production in the Sahelian zone was greatly reduced with respect to the savanna zone, this was somewhat compensated by much higher protein/nitrogen content of range species in the northern areas. Nitrogen, then, is more of a limiting factor in savanna than in Sahelian ranges.

Health care of livestock becomes more critical in zones with higher rainfall (moisture), because of the conditions that favor the evolution of fungal and bacterial diseases. Major livestock diseases in

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<sup>2</sup> Personal communication from Abou Berthe, zootechnicien in USAID-FSR project in Mali.

the project area have been discussed in documents including Secretariat d'Etat a l'Elevage (1990a); Secretariat d'Etat a l'Elevage (1990b); and PNGTV-Hauts Bassins (1989a).

*Peste bovine* is a common cattle disease in the zone. The Campagne Panafricaine de Lutte Contre la Peste Bovine has been successful in developing and diffusing a bivalent vaccine active against the *peste bovine* as well as another major cattle disease: a pleuropneumonia-like disease (*peri-pneumonie contagieuse bovine*). Although villages associated with projects, such as Zorgho, have constructed vaccination corrals, these are not widespread in the project zone and the lack of this type of infrastructure in villages tends to decrease efficiency of agents of the Service Provincial de l'Elevage. This service has historically had little support by outside donor agencies and operates on budgets that restrict wide coverage of livestock health. Consequently, although vaccines may be available for many of the major livestock diseases in an area, problems in their distribution restrict widespread use.

Other cattle diseases in the project zone are anthrax (*charbons bacteridiens et symptomatiques*), tuberculosis (*tuberculose*), pasteurilla-based disease (*pasteurelloses*), and trypanosomiasis. There are forms of trypanosomiasis that infect sheep and goats; donkeys and horses; and cattle. Worms in the digestive tract (*le parasitisme gastro-intestinale*) also are problematic and require de-worming products that are available at the provincial level, but not necessarily in villages.

The cattle race, N'Dama, is tolerant to tse-tse-carried trypanosomiasis. They are adapted to higher rainfall areas. The N'Dama is a short-statured animal in comparison with the northern breed, Zebu. Although the smaller stature of the N'Dama reflects on its traction capacity to plow fields, current breeding programs are successfully transferring the tolerance to trypanosomiasis from the N'Dama to Zebu cattle. The resulting hybrid, called Mere or Metisse, is of intermediate stature and carries intermediate tolerance to the disease. The Mere is widely used for animal traction in zones where the disease is common and where intermediate tolerance is effective. This includes the 1000-1200 mm rainfall zone of southern Mali. There, farmers implement their own breeding programs and now know the percentage Zebu versus N'Dama that confers needed tolerance to trypanosomiasis, while maintaining adequate traction capacity (IER/DRSPR, 1981).

Chickens are subject to annual epidemics of Newcastle disease. The epidemic breaks out every year between March and April, and results in the decimation of all chickens. Although tolerant breeds of chickens exist (Rhode Island Reds, for example) and vaccines are available, farmers in villages do not have access to them. The vaccine needs refrigeration and this contributes to distribution constraints. Guinea fowl are not subject to Newcastle disease and are often the only poultry found in the project area during the dry season.

## Zonation

Zoning of *terroirs* in the project area (PNGTV-Hauts Bassins test villages) shows considerable variation in relative proportions of land in the forest zone (*mise en defense*), the range and pasture zone (*domaine protégé*) and the cropping zone (*zone de culture*). The cropping zone is divided into cropping and fallow areas and, in the case of Diasaga in Kenedougou Province, an additional zone for tree fruit production is included (Burkina Faso Natural Resources Management Assessment, 1990). In Sebedougou, Houet Province, the *terroir* has a total of 8,013 ha, of which 20 percent (1,635 ha) is included in the forest zone, 38 percent (3,007 ha) in the pasture zone, and 3,371 ha, or 42 percent, in the cropping/fallow zone.

Koura is a test village with high population density and land pressure, located on the Houet side of the classified forest of Tui. Aerial photos and ground truthing indicated that 20 percent of the *terroir* was in cultivation, while soil type A, with good agriculture potential, represented 19 percent of the *terroir*. Soil capability classes and topographical relief account for most of the variation in the proportion of village land in each of the zones (PNGTV-Hauts Bassins, 1989b).

Although forest and range zones have been set aside in the test villages, and the range land is being exploited for livestock grazing, no management plans have been designed and implemented in these two zones. Work on the integration of livestock and agriculture, an extension theme in the project area, has begun, however. Soil fertility and soil conservation practices have been implemented, resulting in progress towards sustainable cropping systems in the test villages (PNGTV-Hauts Bassins, 1989a and b) and (Burkina Faso NRM-Assessment, 1990).

Zoning has not been implemented in *terroirs* outside of the five test villages. It is the experience gained in establishing Village Land Management Committees and zoning village lands, and the approaches developed in the PNGTV Project of the Hauts Bassins, which will inform NRM Project *terroir*-level intervention.

**PROBLEM ANALYSIS:  
CONDITIONS AND ACTIONS THAT INFLUENCE THE ADOPTION AND  
DIFFUSION OF BETTER NATURAL RESOURCE MANAGEMENT PRACTICES**

Many practices that result in higher income and yields and better management of the natural resource base can be observed across the Sahelian/savanna zones of West and Central Africa. These experiences form a base from which it is important to draw the lessons learned. This does not imply that research is no longer needed.

The project will draw on this experience by diffusing practices shown to be successful in producing higher incomes and yields, while resulting in better management of natural resources. The project will lay the foundation for new technology drawn from research to disseminate improved varieties, better soil and water management practices, and other improvements. The project will provide an infrastructure within which pre-extension and extension actions can test, evaluate, and apply this learning. It will also provide feedback to agriculture and forestry research to help orient future investigation.

Table 2 shows the time frame for adoption of practices responding to biophysical constraints that have been observed in the southwest region by farmers and extension personnel. This time frame is based on experience in the Sahel, where progress in adoption of practices has followed steps logical to the farm and *terroir* levels.

The time frame also takes into account constraints to diffusion influenced, among other factors, by institutional support capacity. The following discussion will indicate which experiences have contributed to our learning curve. It will show what conditions and actions the southwest Burkina Faso NRMS project will address and implement, in order to diffuse better management practices shown to sustain increases in income and yield.



**Table 2. Biophysical constraints and time frame matrix of practices that have been used to address them**

Biophysical Constraints	(1-2 years) Short term	(3-5 years) Medium term	(>5 years) Long term
Soil fertility			
O.M. <sup>a</sup> maintenance	Compost pits	Improved fallow	Agroforestry ie.
Land pressure	Livestock stable	in crop rotation	mineral recyl.
Runoff of O.M. amendments and mineral fertilizer	residue <sup>b</sup>		and O.M. suppl.
High leaching potential	Burkina rock P <sub>2</sub> O <sub>5</sub>		
Potential for low pH and Al <sup>+++</sup> solubility	NPK mineral fert.		
	Conservation practices (see below)		
	Donkey or ox drawn carts		
	Plowing in crop residue, compost and manure		
Soil conservation			
Wind erosion	Contour dikes	Filter dikes	Agroforestry
Water erosion	Grass strips	Stabilization	Water retention
Decreasing vegetative cover	Contour plowing	of water run-off areas	dams
O.M. maintenance			Windbreaks
Loss of soil physical/chemical properties			
Forest & range resources			
Field encroachment	Forest zone	Live fencing	Seedcake policy
Fire hazard	managem't plan	Pole plantations	interventions
Overgrazing	Range zone management plan	Livestock product	Agroforestry
Livestock services ie. health, feed supplement etc.	Forage crops	enterprise diver.	tree forage
Corridors for livestock passage and watering	Livestock enclosures	ie. cow-calf oper,	Village and
Degradation	Livestock vaccinations	milk, oxen, eggs,	regional pro-
Extension support	Seedcake supplement	chickens, rabbits,	cessing infra-
	Cut & carry forage from forest zone	wool, small rumin. production systems etc.	structure

<sup>a</sup> Organic matter.

<sup>b</sup> Livestock stable residue includes cereal stalk hay residue, manure and urine residues, other forage residue and applied rock phosphate to resolve constraints associated with its application.

## Soil Fertility: Conditions and Actions Addressing Diffusion Constraints

### Example for the Short Term

#### Compost Pits

##### Supporting practices & technology

Donkey or ox driven cart to haul crop residue to pit and compost to field

Plow and AT for compost incorporation

Cash crop cultivation

Source of manure or N for decomposition and C/N ratio

Burkina rock phosphate

##### Conditions

Access to credit

Access to credit

Subsistence needs already satisfied

Either have livestock, other access to manure or credit for N

Access to credit or project could provide

##### Project actions

NGOS project must liaise with available credit institutions in the area including CNCA. Training and establishment of VLNC and groupements will address the village capacity for loan and risk management, as ways for farms to access credit and reduce risk of loan repayment.

Training and support for extension personnel. Viable rotations where cereal crops benefit from cash crop inputs such as fert. and AT.

Site visits and extension training/support. Determination of farm livestock resource and need for N.

Project provides as support to VLNC.

## Example for the Long Term

### Agroforestry

#### Supporting practices & technology

Contour dikes and other soil conservation measures already implemented in fields of farms

Tree planting along contours

AT, plow and carts for organic matter incorporation and rock transport

Improved livestock management via enclosures, animal health, forage crops and seed-cake supplement

Live fencing

Mineral N-P fert. and/or Burkina rock phosphate

#### Conditions

Tenure security and information exchange

Tenure security and nurseries

Access to credit for oxen and equipment

Implication of entire village, information exchange, credit access and seed-cake policy review

Information exchange and tenure security

Access to credit

#### Project Actions

NRMS project will aide in RAF interpretation giving terroir members necessary usufruct rights. Establish and support (training) VLNC to negotiate contracts. Organize site visits where practices have been implemented. Train NET agents in nursery establishment.

Training of VLNC and groupements in credit worthiness. Contact with CNCA and other credit institutions.

Training of SPE agents in animal health and nutrition. Village organization via VLNC around communal benefit streams for which intensified livestock management is necessary. Provide information to policy makers concerning availability and sale of cotton and other seedcake.

Organize site visits where live fencing has been implemented. Aide in appropriate RAF interpretation. Train extension agents (NET and CRPA) in establishment and maintenance of live fencing.

VLNC or groupement credit dossier or project may subsidize BF rock P<sub>2</sub>O<sub>5</sub>.

## Soil Conservation: Conditions and Actions Addressing Diffusion Constraints

### Example for the Short Term

#### Contour Dikes

##### Supporting practices & technology

Animal traction, carts and plow to haul rock and incorporate O.M. to benefit from the dikes

Labor availability

Topographic and leveling instruments

Compost and/or livestock stable residue to get benefit from dikes

Mineral N-P fertilizer for additional benefit from dikes

##### Conditions

Access to credit

Involvement of entire village and information exchange

Decision to implement dike construction and exchange of information

Possess livestock or other access to manure

Access to credit or other means

##### Project actions

Support and training to VLNC for loan negotiation. Contact with credit institutions.

Establishment of broad based VLNC. Site visits. Benefit streams that implicate entire village.

Technical assistance. Training of extension agents. Training of villagers. Site visits.

Benefit streams on farms. Cash crop diversity. Exchange of range for manure from livestock herders. Integration of livestock and agriculture.

VLNC support and training for loan negotiation. Project may subsidize BF rock  $P_2O_5$ .

**Example for the Long Term**

**Windbreaks**

**Supporting practices & technology**

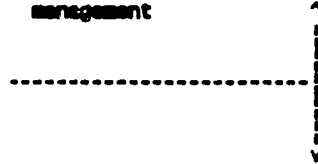
Planting of trees along field limits

Met series

AT and equipment including carts to transport seedlings and plow for O.M. incorpor. and viable crop rotations

Improved livestock management

Field stabilization



**Conditions**

Tenure security, village consensus and exchange of information

Information exchange, as well as access to water and tree stock

Access to credit

Village consensus as well as access to credit and information

Soil fertility maintenance including viable crop rotations with legumes and fallow, agroforestry, and O.M. production & incorporation

**Project actions**

Establishment of VLNC. Training and support to VLNC for contract negotiation. Favorable RAF interpretation (LTC type TA). Communal benefit streams. Site visits. Training of NET and CRPA (SPA) agents.

Site visits. Training of NET and SPA agents. Contact and liaison with institutions involved in wells construction.

Support and training of VLNC for credit negotiation. Contact with credit institutions.

Establishment of communal benefit streams in which improved livestock management is pre-condition for exploitation. Train SPE agents. VLNC credit capability. Site visits.

Training of SPA and Met agents. Cash crop diversity. Site visits. TA for planning and implementing.

## Range and Forest Resources: Conditions and Actions Addressing Diffusion Constraints

### Example for the Short, Medium and Long Terms

#### Forest Zone Management Plan\*

##### Supporting practices & technology

Harvest of wood for local use or for market	Controlled range and/or cut&carry forage with livestock corridors & watering points	Field stabilization with soil fertility mainten. via crop rotat. with legumes & fallow, agro-forestry and O.M. production and incorporation	Planting of trees, establishment of nurseries with better livestock management and live fencing, and pole plantations	AT and carts & plow	Fire control with planned early fires and firebreaks
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##### Conditions

Information exchange, fuelwood needs of village, tenure security, access to markets	Information exchange, tenure security and village consensus	Information exchange, tenure security, access to short and medium term credit	Information exchange, tenure security, village consensus and access to markets	Access to medium term credit	Tenure security, policy changes & informat. exchange
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##### Project actions

Site visits within the country (farmer to farmer) and visits to projects in West Africa (Mali, Senegal and Niger (policy/decision makers and project personnel). Establish Village Land Management Committees (VLMC) and support with training for negotiation of contracts with project and GOBF for usufruct rights and tenure security (Land Tenure Center type assistance). Village consensus will be gained by establishing benefit streams that implicate the whole village and for which better management practices (livestock, for example) are necessary. This is one of the reasons that project will adopt the village or terroir approach. Training of MET and SPA/SPE (CRPA) agents. Credit needs will be addressed by training of VLMC and groupements to create credit dossiers to present to lending institutions (CLUSA type assistance), as well as making contact with credit institutions such as CNCA for short and medium term agriculture credit. Access to markets studied by project TA and fit to enterprise development in the terroirs.

\* The forest zone management plan is clearly a short, medium and long term effort. It is considered here in the short term since it is in this time frame that implementation must be begun. Most nonwood products are not listed here (except range and forage) but would be considered in management plan.

## Cash Crop Diversification: Conditions and Actions Addressing Diffusion Constraints

Cotton is the primary cash crop grown on farms in the project area, though in Comoe there is little cotton production and in Kenedougou tree fruit production is also significantly important. Cotton is cultivated in family fields under the management of the male head of household or exploitation.

Groundnuts are a cash crop found on most farms in the project area. Groundnuts are cultivated by women in the household, who use the revenue from sales to buy condiments for evening meal sauces. Women also cultivate hibiscus, yams, sweet potatoes and other condiments that would have to be bought if a woman did not cultivate them herself.

Lowland rice (*riz de bas-fonds*) is also cultivated by women. It may be sold to buy condiments, cloth or medicine, or prepared as a special dish. Sesame (benniseed) also is cultivated as a cash crop, but access to markets appears to be a major constraint to increased production of sesame (see Burkina Faso Natural Resources Management Assessment, 1990).

The southwest potential for diversification of cash crops is large (NRMS Assessment, 1990). Some of the crops that could be used for both on-farm consumption and market retail are maize, upland rice, cowpeas, groundnuts, and pigeon peas. Other crop-based enterprises include tree fruit production, sesame, and forage crop production. Access to credit, markets, and information will condition their adoption by farmers in the region. Some of the constraints to the diffusion of these crops are cereal market instability in the region; paucity of market information; and rural infrastructure, including roads, transportation, and extension agent training. The project should mount a several-pronged attack to address these conditions as well as the diffusion constraints that are associated with them:

- Conduct market feasibility studies of these crops;
- Identify the project inputs necessary for these crops to be added to crop rotations such that their inclusion mobilizes the animal traction and equipment reserves in *terroirs* and can repay short term agricultural inputs necessary for adequate yield responses;
- Train agents in the field; conduct site visits to villages where farmers are cultivating these crops; and design and implement a pre-extension program that will identify diffusion constraints and demonstrate to farmers better management practices;
- Analyze the training program, site visits and results from the pre-extension tests. Also supervise and advise on repayment of credit with in-kind (product) reimbursement;
- Follow through on marketing of the product that farmers have used to repay project credit;
- Identify the constraints that farmers in the *terroir* confronted in developing a crop based enterprise. Livestock management? Training of traction animals? Access to traction and equipment? Determine project inputs for the following season;
- Characterize input levels, cultural techniques, planting dates and storage facilities as a function of yield. Identify output levels associated with input and management levels; and
- Identify available credit sources in the project area. Work towards a more sustainable credit situation where village managed enterprises can assume the lion's share of responsibility.

Forages will become cash crops when livestock enterprises diversify and management practices change. The project will introduce them to rotation on farms with animal traction. Wider market potential will arise as greater diversification of livestock enterprises occurs. In the medium term, herder groups might manage the livestock of such enterprises and farmers produce grain and forage for them.

## Summary and Conclusions From the Analysis

There are three conditions that reappear on all the above examples of practices that result in better natural resource management. The first is use right (tenure) security, which is critical for long-term investment in the natural resource base by rural community members. Since decisions affecting natural resource management at the *terroir* level are made by individual farmers, herders and woodcutters, and their community organizations, they must be assured that benefits from natural-resource-based enterprise streams will return to them. Tree planting, making contour dikes, composting, and use of rock phosphate all suppose the pre-condition of tenure security for diffusion to occur on a large scale.

In Niger, the rural code was changed first to accommodate live-wood cutting in classified forest areas. Later, the code was changed throughout the entire country. The Land Tenure Center was instrumental in negotiations between villagers and governmental agencies that finally resulted in these changes to the rural tenure code.

In southwest Burkina Faso, as in Mali, traditional decision makers decide who can plant trees in the *terroir*, because the planting of trees indicates proprietary rights over portions of communal land. Autochthonous families often have the right to plant trees on land to which the family has traditional claims. Newer families in the *terroir* generally can not plant trees because the land is only 'loaned' to them to cultivate. In test villages of the PNGTV-Hauts Bassins project area, Village Land Management Committees, with a cross-cutting representation, provided a new infrastructure element from which decisions such as tree planting rights within the *terroir* could be made or revised.

The second condition that appears in all examples given above is access to credit and markets. Technology has the unfortunate habit of belonging only to those who can afford it. To implement practices that would result in yield increases and sustained income, the target client must have either resources or access to credit. Lack of access to resources or credit mitigate against diffusion of such practices. The importance of how the farmer client obtains the resources necessary to invest in technology and new practices has been recognized only within the last 10 years in the Sahel. Much agricultural technology never was used because farmers had no access to credit to buy it.

For all products expected to generate revenue for farm and village, access to markets is critical. Among others these products include wood, livestock, and cash crops. The major constraint to cash crop diversification is access to markets. The project will need to study market channels for all crop and livestock products to be sold outside of the *terroir*. The availability of wood markets will likely be the factor that indicates whether wood production and harvesting can generate a benefit stream aside from filling local fuelwood needs.

Access to credit and markets may imply reduction of risks for those adopting better natural resource management practices. Risks can also be reduced through cost-share plans in which the government or project subsidizes certain inputs in return for practices that result in better resource management. However, caution must always be used in cost-share plans if sustainability is considered. If the government or project can not support the same subsidy widely for all villages in the project area, it will not be sustainable in the longer time frame.



The third condition that appears in the previous examples and influences adoption of better management practices is access to information and technology. Because a wide base of experience is available in Burkina Faso and the Sahel, a major task of the project will be to facilitate exchanges of information. This will be done in the following ways:

- Arrange site visits involving farmer to farmer contact;
- Arrange visits with projects in Mali, Senegal, Niger, and Ghana that have developed ways of dealing with the problems confronting farmers, herders and woodcutters, as well as policy type problems;
- Train agents (MET, CRPA) to train villagers, who will in turn train other villagers; and
- Provide infrastructure capacity for on-farm pre-extension tests (for example, simple with/without treatments). Thus, diffusion constraints for a particular technology or practice can be addressed early in the game.

The above-listed methods of information exchange will also provide access to production technology information.

Food security and either ownership of livestock, or access to manure are also prerequisites to the adoption of the suggested improved practices. The DRSPR project in south Mali has shown that farmers did not cultivate cash crops, especially if the cash crop was nonconsumable, if they were concerned about meeting subsistence needs. If, however, the cash crop were maize, then many of the problems encountered in introducing a cash crop on these farms were resolved. Food security is a primary focus for farmers in the project area.

Composting requires adequate carbon to nitrogen (C/N) ratios. When the ratio is too high (in carbon compared to nitrogen) the decomposition of the materials in the pit is slow and incomplete. Manure is a good source of the nitrogen needed in composting. Urea can be used but, since it is purchased, it may be out of reach for farmers without livestock, or they may need access to credit to obtain it. Since many of the farms in southwest Burkina Faso do not have cattle, ways have to be found for farmers to obtain manure. Trade with herders for manure-against-range may provide some with enough manure for composting in the short term, while solutions for the longer term can be worked out.

Diffusion of better management practices has a synergistic impact on natural resources (biophysical parameters) within the *terroir*, as shown in Table 3 below. Tracing the horizontal effect of a single practice on different natural resources, shows that the practice impacts more than one biophysical parameter.

Animal traction, for example, will have high impact on all five biophysical parameters. Observation shows that many practices will specifically impact a single biophysical parameter (vertical effects). Soil fertility will receive a "high" impact from 13 of 17 listed practices, and "some" impact from two others. Better natural resource management practices (17 are listed), and the degree of impact they have on biophysical parameters, give a notion of the complexity of the interactions to be expected.

**Table 3. Practices (Level 3) expected to impact on biophysical parameters (Level 2) to achieve project goals**

<u>Level 3 practices</u>	<u>Impact on biophysical parameters</u>				
	<u>Forest resources</u>	<u>Range resources</u>	<u>Soil fertility</u>	<u>Soil &amp; water conservation</u>	<u>Crop diversification</u>
Cut & carry	high	high	some	some	none
Tree planting forested areas	high	some	none	some	none
Animal traction units	high	high	high	high	high
AT equipment	high	high	high	high	high
Water pumps	none	high	none	some	high
Compost pits	none	high	high	high	high
Livestock enclosures	high	high	high	some	high
Live fencing	high	high	high	some	high
Contour dikes	none	none	high	high	high
Grass strips	none	some	some	high	some
Agro-forestry	high	high	high	high	some
Improved fallow	some	high	high	some	some
Forage crops in cropping system	some	high	high	some	high
Cash crop diversification	some	high	high	high	high
Livestock enterprises	high	high	high	some	some
Mineral fertilizer	none	some	high	some	high
Field stabilization	high	high	high	high	high

### SUMMARY OF WHAT THE PROJECT WILL DO

The NRM project must provide the framework, and establish three conditions that influence adoption and diffusion of better natural resource management practices on farms and in the *terroirs* of southwest Burkina Faso. Those conditions that have been discussed above are the following:

- Tenure and use right security at *terroir* and farm levels;
- Risk reduction; and

- **Access to information and production technology.** Food security, the objective of subsistence farms, is a condition basic to all three.

The project will establish these conditions through implementation of actions within the agricultural and forestry extension framework in the project area. The underlying rationale of the project is that the major decision makers in natural resource management are the farmers, herders, and woodcutters who exploit these resources, and who have the most at stake in developing sustainable systems.

The project will establish Village Land Management Committees in *terroirs*. The VLMCs will be trained by project technical assistance to negotiate contracts involving rural land code interpretations that are favorable to the establishment of tenure security, so that benefits arising from investments in *terroir* natural resources will return to the community. Contract negotiation between the project and village will result in agreements under which the community and project will work together.

The project will introduce land use planning concepts and help in the zoning of major land use areas (natural resources) in the *terroir*. The project will identify and help initiate natural resource benefit streams implicating the entire village. The project will help design and implement management plans for forest and range areas within the *terroir*.

Information (and technology) exchanges will be organized by the project and implemented within the extension framework in the southwest. These will involve farmer to farmer, and *terroir* to *terroir* site visits; visits for policy makers, project personnel and community members within the region, where better natural resource management practices are being implemented ; pre-extension tests; training of forestry, agriculture and livestock agents; identification of market constraints; and production strategy design, and implementation support for community members.

The project will implement strategies that address interactions between enterprises. It will promote the integration of agriculture, livestock and forestry enterprises on the farm and in the *terroirs* by addressing conditions necessary for the adoption of animal traction, livestock health and nutrition, and diversification of cash crop production enterprises. The project will actively address reduction of risk by training VLMCs and village groups to create viable credit dossiers. It will implement actions that bring VLMCs into contact with credit institutions in the area.

The project will investigate and provide information on policies influencing natural resource management in *terroirs*. Examples of such policies are: rural code interpretations, cottonseed meal export, cutting of live wood, or using management plans and fire policy.

The project will promote field stabilization in the annual crop zone of the *terroirs*. It will provide the information necessary for farmers to adopt soil conservation measures, thus enabling them to maintain soil fertility in their fields.

Implementation of these actions by the project will establish conditions for widespread adoption of better natural resource management practices. The practices are listed in Tables 2 and 4 and in Diagram 1. Adoption of the practices will impact natural resources and biophysical parameters as shown in Diagram 1. The impact of the practices on biophysical parameters will result in project success in attaining its goal. The project goal is sustainable increases in income and yields through better management of natural resources.

## DIAGRAM 1. LEVELS OF CHANGE FOR ACHIEVEMENT OF SUSTAINABLE NATURAL RESOURCE MANAGEMENT WITH PROPOSED TERROIR LEVEL INTERVENTIONS

Level 5. Sustainable increase in income and yield through better management of natural resources. Measured in KG/HA and FCFA.

Level 4. Biophysical changes to achieve Level 5.

<u>Forest Resources</u>	<u>Range Resources</u>	<u>Cash Crop Diversity</u>	<u>Soil Fertility Management</u>	<u>Soil &amp; Water Conservation</u>
Changes in species comp., groundcover and standing volume.	Changes in total biomass, species, nutri. value and carrying capacity. M <sup>2</sup> Ha.	Kg/ha. FCFA/ha. Labor alloc. Crop rotation.	Soil and plant issue analyses. Yield response. Adoption rate. M <sup>2</sup> hectares.	Top soil depth. Erosion. Moisture reten. Change in crops.

Level 3. Adoption of practices that produce biophysical changes in Level 4.

Animal traction and equipment	Compost pits/livestock enclosures	Contour dikes
Vegetation strips	Improved fallow	Field stabilization
Chemical fertilizer	Agro-forestry	Livestock enterprises/diversification
Tree planting in forested areas	New crops	Cut and carry

Level 2. Conditions that contribute to adoption of above practices.

Tenure/use right security at <u>terroir</u> and farm levels	Risk reduction	Access to information and production technology Food security
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Level 1. Actions by project that establish conditions.

Estab. of Village Land Management Committee	Access to credit	Extension agent training
Contract between VLMC and GOBF (RAF interpretation at <u>terroir</u> level).	Access to markets	Technical backstopping
Zoning of <u>terroir</u>	Cost share plans	Land use planning
		Training and incorporation of forest agents in project
		Coordinate extension and pre-extension program with on-station and on-farm research
Strengthening of Village Land Management Committees and Groupements		Elaboration of partial budgets and cost/benefit analyses
		Adaption of technical interventions to specific <u>terroirs</u>
		Pre-extension testing of technology and practices

## **TECHNICAL ASSISTANCE FOR IMPLEMENTATION OF *TERROIR*-LEVEL PROJECT ACTIONS**

### **General Profile**

All members of the technical assistance team must share certain attributes in order to work together, and effectively with personnel of local institutions. Some of the technical assistance team will be full time while others will be part time. Part time technical assistance will work for 1-3 months for 2 to 3 periods per year in the project. There must be assurance of continuity for these people so that learning in the first stages of the project will result in a common experience base for all the team. Different stages of the project will emphasize different skills, but team coordination will require both expertise and flexibility.

There are important generalized constraints common to the region, and therefore experience in West African extension services is important for all team members. Among constraints are: blurred lines of authority; lack of communication, transportation, and marketing infrastructure, with accompanying difficulty in accessing villages; and getting inputs to farmers and crops to market.

### **Brief Profile/Scope of Work for TA Specialists**

#### **Land Use Planner**

1. Understanding of geography and topography of the region. Watersheds, drainage basins, soil capability classes and vegetation classification related to topo-sequence, are all areas of expertise related to experience in the region.
2. Some knowledge of the social and economic realities governing ways in which rural populations use the land.
3. Knowledge of forestry, range and crop management in the region.
4. Experience with national and donor institutions in the region involved in land-use planning. Able to use the experience of these institutions and build upon it.

The land use planner will organize and lead a reconnaissance studies team, and prepare the Schéma Directeur (Master Plan) which will determine *terroir* functional zoning with VLMC and community members. The land use planner will also train MET and CRPA agents in zoning procedures, macro planning, and map interpretation. He should have excellent knowledge of West Africa, and can be a full- or part-time team member.

#### **Forester**

1. Understand the social and economic uses to which African rural communities put forest products and by-products.

2. Design and implement a forest-zone management plan at the *terroir* level. The plan will take into consideration production potential of the forest zone, and interaction with other enterprises in the *terroir*, such as livestock use of the forest, transportation of seedlings and forest products, and species availability and selection.

3. Set up nurseries with community resources and management.

4. Train MET agents in forest management, given that much of their training to this point has been in control and policing, rather than management practices.

5. Adapt management plan of forest zone to the fuelwood needs of the community and to market infrastructure (access to markets, roads, buyers and transportation facilities).

Given the scope of work allotted, the forester will be a full-time project team member.

#### **Range Management and Livestock Specialist**

1. Know and understand management practices of Peulh herders, and of autochthonous and migrant farmers, to determine implications for natural resource allocation within the *terroir*.

2. Determine carrying capacity of *terroir* range resources under natural vegetation (hectares/Tropical Livestock Unit — UBT or TLU).

3. Conduct pre-extension tests in range improvement practices and technology, and evaluate impact on carrying capacity.

4. Understand livestock health components.

5. Evaluate feeds including range, forage crops and oilseed supplements.

6. Design, and evaluate viability for livestock enterprise-diversification in the *terroir*.

7. Help design and test forage crops in the crop rotation.

8. Design and implement range management plans in the *terroirs*.

9. Train oxen and donkeys for animal traction. (Needed here is a specific experience in training animals for traction activities.) This is particularly important for farmers with little or no experience with livestock, but also for Peulhs not having used animal traction before.

10. Train extension agents in all of the above.

The range management/livestock specialist position will be full time, given the broad scope of work and diversity of actions critical for project success.

### **Farming Systems Specialist**

This person would be housed within the R&D (*research and development*) section of the CRPAs in the project zone.

1. Adapt better natural resources management practices and technology to the resource base of farms and *terroirs*.
2. Design and conduct pre-extension tests in *terroirs* and on farms.
3. Must have experience and knowledge of the types of interactions that will be promoted between enterprises in the *terroir* based on forestry, livestock (range), and cropland (forage crops, soil fertility and conservation, animal traction, and so forth) resources. This is critical to achieving the vision and goals of the project.
4. Design and participate in reconnaissance studies on the macro level.
5. Facilitate the exchange of information between farmers, planners, and others by organizing site visits, determining extension constraints to diffusion of practices, and fostering contact with INERA research programs and results.
6. Train CRPA (SPA/SPE) agents in technology and management practices and in the above listed domains. This person will augment the infrastructural capacity of the Research/Development section of CRPAs.

The farming systems specialist may be full time during the first two years of the project, later becoming part time, with presence assured during critical times of the growing season.

### **Trainer/Social Scientist**

Social science analysis capability is a priority for the technical assistance associated with this scope of work. Thus, training would be involved in the scope of work for each member of the technical assistance team. The social scientist may take the lead in organizing training sessions, but would be involved directly only with training of MET and CRPA agents in economics (cost/benefit analyses and partial budgets), anthropology (ethnic issues), and in social issues. Training strategy would include the following steps:

1. Project personnel will train agents in the field.
2. The agents will train VLMC-selected farmers, herders, and woodcutters.
3. Trained farmers, herders, and woodcutters will train the rest of the village implicated by the particular training content.
4. Project personnel will supervise and evaluate the training of selected farmers, herders and woodcutters by extension agents, as well as the training of farmers by farmers.

The social scientist will participate in the design and implementation of pre-extension tests. Also he/she will be responsible for economic analyses resulting from the tests. This person will participate in the zoning of *terroirs* and provide economic analyses for the implications. Due to the ethnic diversity of *terroirs*, the social scientist will guide project approaches that may have variable impact on different groups within the *terroir*. A priority task for this person will be to seek broadbased support from all social groups within the *terroir* for project actions. This person will also work with the (CLUSA type) PVO in training of VLMCs and other groups at the *terroir* level.

The social scientist could be either long-term and full-time, or part time. If used by the project on part-time basis, this team member should work in the project at least one-third to one-half time, and should remain the same person.

### **CLUSA-Type PVO**

This scope of work is perhaps the most critical if the project is to generate sustainable actions. This component of the TA will act in the villages at grassroots level to:

- Help establish VLMCs within the *terroirs*;
- Help to identify and implement enterprises with broadbased support which will implicate the whole village in rational exploitation of the natural resources of the *terroir*;
- Design enterprises in the *terroir* and on farms based on good management of existing natural resources. Train VLMC and village groups to create viable credit dossiers that reduce risks for credit institutions to loan them money;
- Train and supervise alphabetization programs at the *terroir* level; and
- Train VLMCs to negotiate contracts, to determine responsible parties, understand obligations within the contract, and to clarify expectations from the project and from the GOBF.

CLUSA (now NCRB) has experience in Niger and Mali, in the activities called for in this scope of work, where agricultural credit was a priority for *terroirs*. Other PVOs that might be considered are TECHNOSERVE and SERVICE DESJARDINS (Canadian based).

### **Legal TA**

The project will need an institution with legal experience in West Africa to establish a favorable interpretation of the Agrarian and Land Reform Legislation (RAF) which can generate tenure security for *terroir* members. Tenure security will mean assurance that those who invest in better natural resource management practices, will receive the benefit from the investments. A major constraint for better management of natural resources at the village level is the lack of tenure security.

Negotiation with the GOBF will likely result in pilot contracts in the villages in which the project works. This is how the Nazinon forestry project resolved the constraint. The accumulation of experience within the country will impact subsequent decisions the government takes in the national context.



The Land Tenure Center based in Wisconsin has experience in Niger, Mali, and Senegal in developing favorable interpretations of rural codes that provide better incentives to good long-range management of the natural resource base.

Table 4. Human resources and project action implementation

Actions	Human Resources								
	Land use Planner	Forester	Range Manager	Farming Systems Specialist	Social Science/ Trainer	Legal/ Tenure Expert	CLUSA type spec.	CRPA	NET
<u>Tenure and use-right security at farm and terroir levels.</u>									
1. Establishment of VLMC <sup>a</sup> .				X	X		X	X	X
2. Contract between VLMC and GDSF.						X	X	X	X
3. Zoning of terroir.	X	X	X	X	X		X	X	X
<u>Risk reduction</u>									
1. Access to credit.		X	X	X	X	X	X	X	X
2. Access to markets.		X	X	X	X		X	X	X
3. Cost share plans.					X		X	X	X
<u>Access to info. and prod. tech.</u>									
1. Extension agent training.	X		X	X	X		X	X	
2. Technical lack-stopping.	X	X	X	X	X		X	X	X
3. Landuse planning	X	X	X	X	X			X	X
4. Forest agent training.	X	X	X	X	X		X		X
5. Coordination research and exten.		X	X	X	X			X	X
6. Partial budgets and cost/benefit analyses.					X		X	X	X
7. Adoptions of technology to spec. terroirs.		X	X	X	X			X	X
8. Pre-extension (with/without) tests.		X	X	X	X			X	X

<sup>a</sup> Village Land Management Committee (VLMC)

### VILLAGE/TERRAIR SELECTION CRITERION

The selection of villages and *terroirs* in which the project will work (within the project area) is a key component to the conceptual framework of this paper. The generation of experiences and the replicability of those experiences within the project area are factors that will influence the success the project will have down line. They will also greatly influence project efficiency since the time invested should impact the whole project area and not just a few villages.

Clearly village organization would be an important criterion for village selection. However, the only villages with established Village Land Management Committees are the PNGTV-Hauts Bassins test villages. The only criterion that fits the project goals and objectives (for sustainability) is that enterprises be identified, based on natural resources in the *terroir*, that involve the whole community and that can coalesce the authority of the VLMC so that zoning of the *terroir* can be accomplished with participation of the whole village. With this criterion, all natural resources within the *terroir* that fulfill the condition of involvement of the entire community are targets. This lends itself to development of more than one enterprise stream and will require flexibility on the part of project personnel.

### STRATEGY OPTIONS FOR PROJECT TO PURSUE AT TERROIR LEVEL

Experience gained in the Sahel has provided lessons on which the project may build for natural resource management on farms and in *terroirs* of southwest Burkina Faso. The issues section which follows will discuss some problem areas which these project strategy options would attempt to address. Some of the strategies here presented require preliminary study to develop requisite information which would permit adequate response in the project design. The goal of the *terroir* VLM project is to achieve sustainable increases in income and yields through better management of the southwest Burkina natural resource base.

#### Start-off Targets for Project Actions and Technical Assistance

The project zone of intervention may be determined to be a political zone such as a department; or it may be defined by a natural boundary such as a protected range, forest area, or watershed. In either case, the village *terroirs* within the department or watershed, or surrounding the protected area, constitute the project's lowest common denominator.

The project should first identify potential enterprises in the given target area. Assessment of potential activities will concentrate on increasing income and yield through better management of the *terroir* natural resources. The actual resources may variably be under the management of farmers, herders or woodcutters, or the community.

Initial action consists of the reconnaissance survey of the area. The team will be assembled and scopes of work defined. They will identify potential promising village-based, natural-resource-conservation-oriented enterprises. They will determine in which villages the project can/should work, and best methods of support for eventual creation of Village Land Management Committees and *terroir* zoning.

The forester and range management/livestock specialists, with legal help from that component of technical assistance, and in cooperation with the PNGTV-Hauts Bassins team, will construct and propose management plans for forest and range zones of the PNGTV test villages.

Where villages are already zoned, and possess land management councils, but as yet have not developed management plans, this action can launch that work. By working first in those villages where a functional VLMC has been established, and zoning already undertaken, the project can hope for early successes. These villages can then become demonstration sites for visits from other villages which are

developing land management committees and zoning plans. The full technical assistance team, with homologues, will be implicated in this work, but it will be the primary focus for the forester and range-management specialist.

The land use planner, farming systems specialist, social scientist, and PVO village organization specialist will begin work in the new villages selected from the reconnaissance survey. They will help to catalyze organization of VLMCs and village zoning efforts, facilitate the exchange of information, and assist village identification and initiation of other enterprises. They will monitor and assist development of contracts between village and State Agencies and Project. The full TA team with counterparts will be involved.

### **Approach Options to Address all Strata of the *Terroir* Community**

Anarchic migration from the Central Plateau and the steadily dryer steppe to the north pose problems for protective management of the natural resource base in the southwest. Sometimes the indigenous village group is the poorest among all groups that have come to settle in the *terroir*. Thus the case of the Bwaba in the PNGTV-Hauts Bassins test village of Koura, and the Tiefa in Kimi.

This was true in the Bougouni area of Mali, where the Peulh were relatively richer than indigenous Bambara farmers. For project interventions, it proved necessary to base planning on resources available to the Bambara, yet include Peulh herder/farmers in these interventions as well. Common opinion among the Bambara was that the Peulh had resources to commit to new practices, which the Bambara could not afford to risk. What the Peulh could undertake was not viewed as acceptable to the Bambara farmers. The lesson here is that different groups within the population may be viewed as having different capacity to absorb and use proffered new technology.

The same sort of problem has dogged extension and pre-extension efforts that have targeted pilot farmers chosen to be examples for the diffusion of technology within a village and area. Caution is warranted since pilot farmers may have been chosen because they have access to resources that other farmers do not, and can afford risks that other farmers do not see as possible.

A pilot village approach was implemented in the Operation Mils Mopti (OMM) extension project in Mali, as well as in other extension projects of the region. A pilot village established in each of three sectors of the extension zone received special credit and extension conditions. By project termination, the three villages were well in advance of neighboring villages, but the actions were unsustainable by the extension agency. This pilot village approach has largely been discarded as too costly to sustain, particularly since villages chosen are not necessarily representative of the region as a whole.

Yet another example of an approach that has been discarded is that of the French project, Unite Experimentale, in Senegal. Researchers assumed control of extension activities for a Zone d'Expansion Rurale (ZER). The remarkable progress made within the ZER could not be replicated in any other ZER because of the high cost involved.

Lessons learned in the Sahel show the following as terms of reference for probable project success:

- Resources vary within the village context. These may be aligned by ethnic group, as in the case of Peulh herders and indigenous farmers, or within the same group, as in the case of pilot farmers. Project actions that target those with resources to benefit immediately from project interventions do not reach others who feel they cannot afford the risks. Consequently, early successes the project may show in influencing natural resource management at the farm level will not be sustainable if other village strata do not adopt these practices;
- Extension constraints play a major role in diffusion and sustainability of better natural resource management practices. Constraints to the adoption of technology by farmers (and others) must be considered as important as the constraints posed by natural conditions and lack of infrastructure; and
- Village approaches may be slower to begin with than other approaches in the repertoire, and often must be defined in relation to the conditions of a particular village, thus posing flexibility in the training of agents. However, the potential exists for sustainable, dynamic village development in the medium term (2-3 years), at the cost of slower observable gains in the short term. Extension agents can be trained to adapt packages of practices and technology to *terroir* conditions when they have the support of the village community and their superiors.

Success in getting village-wide support for VLMCs and zoning has been observed in the PNGTV-Hauts Bassins project area. Given the constraints we have discussed, the success rate has been remarkable. The NRM project will need to evolve this approach into extension-sustained activity to conserve the natural resource base in the project area.

#### **Use of Materials That can be Sustained After the Project Input is Completed**

The project will need to work within a resource/inputs frame that can be sustained by local people when project funds are no longer available. As example: Barbed wire was used to protect tree nurseries by the AFRICARE reforestation project in Poni and Bougouriba Provinces. It was used in a Dutch FSR project in the Sikasso/Koutiala area of Mali for corral fencing. But barbed wire, an imported product in Sahelian countries out of reach for small landholders, as well as government subsidy capabilities, was not sustainable by West African extension services.

By contrast, the *Projet de Stabilisation des Dunes* in Mauritania approached the problem of protecting trees differently.<sup>3</sup> After considering options, the project successfully used live fencing to protect young trees from destruction by camels, cattle, and sheep in the central region of Mauritania. This solution was successful only in the medium term, since it took two years to establish the live fence around young trees set out in the area. However, short-term solutions would have offered no sustainability in the medium and long terms.

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<sup>3</sup> Personal communication from Oumar Aw, Project Coordinator.

Multiple-purpose live fencing is used in the region for cattle corrals in Mali and Mauritania, for nursery protection in Mali and in Senegal, and also as vegetable (*culture maraichère*) protection in other countries in the region. Live fencing is a medium-term technology that is sustainable for extension services in the region.

It must be noted that better livestock management practices can only be implemented in the medium term. Changing livestock management requires involvement of whole villages, and sooner or later practices must be changed to protect the watershed as well. Most importantly, transhumant practices must align themselves with these changes because the protection offered by live fencing must be complemented by better livestock management in the same areas.

### **Identification of a Sequence of Actions in the *Terroirs* to Support Dynamic Change in Natural Resource Management: A Step-by-Step Process Involving the Whole Community**

The variation within village *terroirs* has been discussed above. Setting in motion a process that brings all local strata to adopt better natural resource management practices should be discussed at this point.

#### **Classification**

Typologies have been used by farming systems research projects in the region, and in the PNGTV-Hauts Bassins approach in test villages in the project area. Typologies are useful because they show the variation within a *terroir* and the kinds of constraints that confront each type in the adoption of better management practices. Flexible use of typologies must be cautioned, however.

The most common parameters for typology classification in the region are based on ethnic group and on-farm power sources (animal traction).

It has been observed that a farm can access animal traction in many ways. Most important factors appear to be whether a farm has available labor to operate an oxen-driven plow, and whether it becomes necessary to possess a traction unit on the farm in order to fulfill needs and requirements. In such case, the farm typed as "manual" can become "equipped" in short order.

Ethnic groups typed as "herders with little interest in commercial crop production," or as "extensive farmers with little regard for the natural resource base," have been observed to change these "typed" patterns in relatively short time when environmental contexts change. That is, a Peulh or Mossi in the southwest will not necessarily continue to practice management patterns adapted to the northern areas or Central Plateau. This is particularly true if the context in the southwest does not allow him to continue to practice them. Typologies, then, should be used as a guideline but should not be seen as static if dynamic change under the management of the village itself is what the project has targeted.

## **Actions**

The first project action will be to identify a potential village enterprise that is natural-resource based, with broad appeal to all strata of the community. In the planning stage community members should learn the value of organization in developing the enterprise and its attendant benefits.

In the course of these actions, the village can opt to establish a Village Land Management Committee. This committee, representing consensus of the village, would take on responsibility to negotiate the contract with the state regarding interpretation of the rural code, thus protecting village groups in their right to the benefits of better natural resource management. It should also negotiate a contract with the NRM project concerning village responsibility and project input into the community.

Literacy programs would be a logical project action at this point. Reading and writing would be necessary to negotiate a contract, manage an enterprise, and apply for credit from a financial institution.

Zoning the *terroir* may be a logical next step for the VLMC. As zoning proceeds, the need for soil conservation practices will become evident, if fields are to remain productive over the longer term.

Maintenance of soil fertility will require the use of manure and compost if fields are to be stabilized. Plowing-in of stubble and organic matter will require the use of animal traction. Site visits will present options to farmers on ways these practices have been adopted by other farmers.

Pre-extension tests on maize, with treatments with and without manure would be appropriate at this point. A choice of cash crop options will be critical if field stabilization is to occur. Cash crops will underline the need to maintain soil fertility, determine the need for animal traction, and indicate the benefits from zoning the annual crops area of the *terroir*. Efforts should be made to implicate farmers without animal traction.

The project may reach an agreement with the VLMC to set a value-price (ratio) for maize (or upland rice) so that crop inputs could be repaid at the end of harvest with grain instead of cash. The agreement might be given a limited duration so that it does not continue indefinitely, but could provide incentive for the community to take part. Such a program could be targeted to farms in the community not cultivating cotton, and consequently without access to credit for crop inputs and animal traction. Linkages with the ARTS project and on-station research for cash-crop options would be important.

Livestock management at the *terroir* level will come into importance as an enterprise stream becomes a reality. The VLMC would be expected to play an important role in determining management modes for *terroir* livestock. Fines may be exacted from livestock owners whose animals cause destruction.

In planning for management of range resources within the *terroir*, farmers from new villages could make site visits to PNGTV test villages where range and forest management plans will have had some success and experience can be shared. Introduction of forage crops into the crop rotation will help resolve some of the problems associated with livestock management changes. Vaccination enclosures in the village should be constructed. Areas for washing livestock of ticks and lice will become part of livestock health programs in the village.

Development of project information circuits could permit villagers to learn, for example, whether supplementing milk-cow and oxen rations with cotton-seed meal versus exporting the meal has higher or lower economic costs for farmers and for the nation.

Diversification of village or farm-level enterprises might be the next step in the project-catalyzed dynamics of change in the *terroir*. This may include small dams for gardening or *bas-fond* rice production; cow-calf, oxen production and sale, or milk production in which farmers might produce the grain, and herders manage the livestock. Cash crop diversification can be matched with market or processing strategy options, following studies developed by project personnel and research institutes. Other enterprises may be developed based on forest products identified in the forest management plan.

Training of traction animals (*dressage*) will become important to the newly initiated. Training the animals may make animal traction a viable element in many farm operations. It has been shown that animal traction is not necessarily an economic benefit to the farm until the animals are used in all cultural operations during the cropping season, and for year-round activities. We have indicated above that animal-traction farms are bigger because they may have more people involved in the exploitation, but not because they necessarily result in cultivation of larger surface area. But the farm as a whole has to adapt to using the traction for seasonal and nonseasonal activities to valorize the investment.

As people invest in soil conservation, and become increasingly aware of soil fertility needs, to render fields stable further practices should be incorporated. One example of this would be grass bands and trees (agroforestry) as add-ons to contour-dike construction. Including fallow periods in crop rotations and windbreaks around fields are other appropriate measures.

### **Team Approach to Multisectoral *Terroir* Development Strategies**

Field technical interventions are now mediated through ministries in Burkina Faso. Hydrology (water management), forestry, agriculture and animal husbandry, and farmer-cooperative development are sponsored in four separate ministries.

One of the most important contributions the project can make will be to integrate in the *terroirs* of the project area management of the interventions by foresters, range managers and livestock specialists, land use planners, cooperative trainers, tenure specialists, agricultural economists, and farming systems specialists. This will demonstrate what can be expected from GOBF initiatives in decentralizing research and development activities in the provinces.

Assessment of project impact can also provide the World Bank and others an experience base from which to evaluate integrated extension approaches and strategies.

It will be critical that the project develop integrated team programs instead of isolated individual programs within vertical institutions.

## CHAPTER FIVE

### INSTITUTIONAL CONTEXT

#### RECENT AND ONGOING ACTIVITIES TO ADDRESS NATURAL RESOURCES MANAGEMENT IN THE SOUTHWEST

##### Background on the PNGTV

In 1986 the Government of Burkina Faso requested international donor assistance to develop and implement a program for village level management of village territory. The 1984 RAF (Agrarian and Land Tenure Reform Act) proposed as its basic principles "a reorganization of national space, and its rational management under the responsibility of rural populations." The PNGTV (National Plan for the Management of Village Lands) was presented as a strategy to decentralize, improve agropastoral production, develop sustainable systems, and protect deteriorating natural resources.

Billed as "participative development" the *terroir* approach, in brief, proposed to initiate dialogue with rural people and bring them to organize comprehensive village management committees, help them inventory and define the extent of village resources and lands, establish with them a land use and management plan, negotiate a contract defining roles and obligations for both village and government services in the management of resources, and support village development efforts through implementation of that agreement.

Objectives of the Program were to:

- Organize rural populations corporately to undertake management of their lands under "contract" with the state;
- Plan and reorient land use for greater productivity and protection of the resource base;
- Reinforce land tenure security for farmers and pastoralists;
- Halt environmental degradation and restore renewable resources;
- Manage internal migration to protect natural resources and optimize use of available lands; and
- Sedentarize herds and herders, and intensify and integrate agriculture and livestock husbandry.<sup>1</sup>

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<sup>1</sup> Ministry of Plan Document, May 1989: *Rapport de synthese et d'analyse des experiences pilotes de gestion des terroirs villageois.*



A pilot phase was designed to test appropriate strategies. A coordinating unit charged with supervision, analysis, evaluation, and preparation of the national program to follow was to be created. Eight ecological, demographic, and social zones across the country were designated to test efforts, though the final choice of pilot projects did not fully accord with this grid.

PILOT PROJECTS chosen were:

<u>FINANCE</u>	<u>PROVINCE</u>	<u>PROJECT</u>
GERMAN/CILSS	BAM	PATECORE
WB/IDA/NORWAY	KENEDOUGOU	NIENA-DIONKELE
WB/CCCE	KOSSI SOUROU MOUHOUN	PROJET GTV/CRPA MOUHOUN
AVV/CCCE	SISSILI MOUHOUN	FARA POURA
RFA	SOUM	PSB
AVV/CCCE/FAC	GANZOURGOU	UP1 ZORGHO
AVV/RFA	BOUGOURIBA	UP10 DIEBOUGOU
WB/CCCE	HOUET KENEDOUGOU	PROJET GTV/CRPA HAUTS BASSINS

Later, as most of the pilot group were concerned with vegetation, three pastoral-zone projects were added as "Projects under Observation." These were: Sideradougou, UP3 Sondre-Est, and Nouhao. Eight further projects were later observed for complementary experience and information.

The preparatory phase was planned to test techniques in zone definition and cartography, agricultural policy and technology, and methods of coordination and collaboration between concerned institutions. Although other funding was involved, major participant donors in this initial phase were the World Bank, the GTZ (German), and the Caisse Centrale (French).

### **Constraints Encountered in the Preparatory Phase**

The May 1989 report on the two-year pilot phase indicates that the Coordinating Unit did not become operational until July 1988 although most of the pilot projects had begun or been in operation from 1986. The lack of central guidance and coordination during this period meant that experience was uneven, and projects were not easily comparable at the time of analysis. Nevertheless certain inferences can be drawn.

In some projects, there was little understanding and even hostility toward the "new" themes of the GTV approach; and a lack of guidelines in laying out GTV operations meant that technicians, operating in their accustomed manner, were not acting to service GTV goals. A competent monitoring service, conceptually clear on program goals and methods, was in default.

A shared view of goals or methods between donors and Burkina sponsors of GTV policy was sometimes lacking. On occasion, GTV goals were given low priority where funds were limited. Not all project personnel approved GTV as opposed to PDRI (Integrated Rural Development Project) concepts. And various NGOs felt the integrity of their operations might be placed in jeopardy or taken over.

In other instances, neither technical extension people nor villagers were given sufficient information or training to understand or implement the new methods. A serious shortfall was encountered when limited technical service personnel could not cover GTV without neglecting existing duties and programs.

In a social caveat, the above report also carefully marks the point that the constitution of Village Management Committees in a democratic manner, while respecting sensitivities of traditional leadership, and subsequent zoning of the *terroir*, are socially delicate operations. It is imperative that they be followed by official recognition for Committee status, and its jurisdiction over the territory as defined.

#### **World Bank's Proposed PNGTV Program**

World Bank is currently in the design process for a major environmental management project to continue and extend the PNGTV strategy for development and conservation in Burkina. The first five-year phase of this project is expected to touch 1,120 communities. Major elements of the project will include land management in the GTV mode in the provinces of Oudalan, Kouritenga, and Kenedougou; forest resource management in Houet and Bougouriba provinces; special funding in the provinces of Bam, Ganzourgou, and Bougouriba; and technical support, training, and methodologies offered to projects in 14 other provinces.

There will be a country-wide environmental monitoring element in this project, which will probably work with IRBET, and will develop capability in the Burkinabe Geographic Institute for remote sensing and mapping technology.

Funding for the project will in part be disbursed at the central level, and in part at the provincial level through the Caisse Nationale de Crédit Agricole (CNCA).<sup>2</sup> Coordination of the multisectoral project will be dispersed, with elements at village, zone, provincial, regional, and national levels. Major coordination will take place through the Provincial Coordinating Unit, in the framework of the Provincial Land Management Commission under the authority of the High Commissioner (province level). This will link all the technical services to the GTV effort, and serve as the inter-service hinge. The National Coordinating Unit (NCU), in the Ministry of Agriculture, will be chaired by the General Secretary, and will join elements from the Ministries of Agriculture and Livestock, Environment and Tourism, Cooperative Peasant Action, Water, Plan and Cooperation, Territorial Administration, and Finance. A

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<sup>2</sup> We suggest the caveat here that project designers, if interested in this mechanism, should carefully examine its constraints and operations records.

National Consultative Committee will adduce other ministerial inputs as needed. A National Sub-Commission on GTV with oversight and national strategy planning functions will be lodged in the Ministry of Plan.<sup>3</sup> (In the preparatory phase, the PNGTV was lodged in the Ministry of Plan, but in the new WB Environment Project this function will move to the Ministry of Agriculture. This represents a change in ministerial locus, which is, perhaps, a scientific choice.)

### **Other Potential Options**

Many development methods have been presented in the Sahel, from Burkina's erstwhile ORDs, to a standard-package integrated rural development approach. Most earlier approaches have been grounded in ideas of food self-sufficiency and production enhancement. What is new, and seems most promising in the GTV option, is that all actions promise to join development to conservation. Because the Government of Burkina has chosen the GTV paradigm to deploy all its conservation plans (PANE,<sup>4</sup> PNLCD,<sup>5</sup> and PAFT),<sup>6</sup> and is reorienting ministries to accommodate this decentralized approach, we believe the GTV selection is the one which USAID can most usefully adopt. This promises to be a flexible frame which USAID can modify as needed. (See proposed project structure at the end of this chapter.)

### **Issues for the PNGTV**

#### **Decentralization**

By accepting PNGTV as its strategy in the attempt to achieve sustainable food production and conservation of the natural resource base, the GOBF commits itself to devolve a significant level of authority to the village management committees. It is expected that all villages should form such committees, which will then become legal entities with which government can contract. (They may also be configured as the village level seat of authority in the hierarchy of the Ministry of Territorial Administration.) In this plan, GTV efforts will be a major implementation focus for the PANE (Plan d'Action Nationale sur l'Environnement), and incorporate most of the orientations for the Sahel delineated at the CILSS/CLUB Conference in May of 1989 at Segou.<sup>7</sup>

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<sup>3</sup> For further information consult the World Bank Environmental Management Project for Burkina Faso, June 1990.

<sup>4</sup> Plan d'Action National pour l'Environnement.

<sup>5</sup> National Anti-Desertification Plan.

<sup>6</sup> Tropical Forest Action Plan.

<sup>7</sup> Principles and objectives enunciated at Segou were: Ecological rehabilitation, management of local *terroirs* with local collectivities, decentralization, stabilization of land tenure, use of credit and local savings, involvement of women, injection of information and training, and an aim to balance population with training.

In line with decentralization and regionalization, the Ministry of Plan has defined 10 planning regions across the country, and expects to create offices and allocate personnel, including the Service d'Aménagement du Territoire, at the regional and provincial levels. In MinPlan's view, these should serve as coordinating units for GTV action, and other development and conservation projects; also as the permanent secretariat for the Comité de Concertation of all ministerial technical services and development agencies (unclear yet as to whether at provincial or regional level, or both). Other ministries are following the same regionalizing plan, with only Agriculture and Health currently using different systems of division. (This is in the planning stage, but not yet the reality everywhere.)

## **ISSUES**

### **Choice of Venue for the USAID Project, and Coordination with Other Donors**

The Mission has determined that it wishes to work in the southwest of Burkina Faso, because of the residual potential of this area, as well as the current threats to the environment there. In so doing, it must take cognizance of other donor projects and plans for the same region.

Within the framework of the GTV strategy, both World Bank and the CCCE will be working in Houet Province:

- The CCCE (French) will continue to work in Kossi, Houet, and Mouhoun. In Houet, their effort will touch a minimum of 30 villages. Although the effort will use the land-use-management approach for multisectoral efforts, their focus will continue to be cotton cash cropping.
- World Bank, as indicated above, expects to work in Houet and Bougouriba in the GTV frame, but with an emphasis on forest management in the gazetted Forests of Maro and Dan. With the Bougouriba forests included, 57 villages will be affected, with a population of 62,000 inhabitants.

Because there are limitations to the load which GOBF administrative and technical services can carry, and to their absorptive capacity for technical assistance, training, and so forth, it will be imperative for USAID to confer and coordinate closely with these other donors in the planning stages of the Natural Resources Management Project, to design interaction and complementarity and avoid useless competition and redundancy. One area of promise is the PANE proposed Regional Center for information and documentation. This could be made to provide a wider communication function.

### **Institutional Affiliation**

USAID will need to address the issue of institutional affiliation for the NRM project. The concepts team believes the project should not seek a ministry of tutelage but, structured as an NGO-managed activity (lightly supervised by the MinPlan Bureau de Suivis des ONGs), plan to work under joint supervision of the provincial High Commissioners concerned. The coordinating unit with ministerial technical services would be the Committee of Concertation either at the regional or provincial level

(depending on how these developing structures have progressed). From this would derive the Technical Steering Committee for the project.

Reasoning for this decision is as follows. The Ministry of Environment is too weak, understaffed, undertrained, and improperly oriented to be the ministry of choice. The Ministry of Agriculture is by far the strongest and most effective, but will already be heavily burdened with the proposed GTV load from other donor projects. Other affected ministries do not carry the appropriate mandate for the horizon of this project. Since the NGO Management Unit will coordinate planning and activity for the project, liaison, not tutelage, is needed with all relevant ministries. (The team proposes institution-building efforts for the Ministry of Environment and Tourism.)

### **ROLES AND MANDATES OF KEY STRATEGIES AND INSTITUTIONS INVOLVED IN NRM IN THE REGION**

#### **Plans**

##### **The Plan National pour la Lutte Contre la Desertification (PNLCD)**

In line with regional conceptions and initiatives coming out of the Conferences of Nouakchott and Segou, Burkina Faso has established a national strategy for the fight against desert encroachment. Representing a national strategy for an integrated approach to development and conservation, the PNLCD is anchored by a National Committee for the Fight against Desertification (CNLCD). Primary responsibility for PNLCD programs is lodged in the Ministry of Environment, but the CNLCD is an interministerial coordinating unit, with the Ministry of Agriculture and Animal Husbandry, the Ministry of Plan (Aménagement du Territoire), and the Ministry of Territorial Administration all closely implicated.

To date, the PNLCD is really active and effective only in the Burkinabe Sahel Program (PSB), which concerns the three Sahelian provinces of Oudalan, Soum, and Seno. But the overall strategy of the PNLCD indicates advanced national thinking, and informs current efforts toward regionalization of government structures, and concepts of integrated planning for the National Plan (PNTV), and the National Action Plan for the Environment. It proposes that LCD (fight against desertification) activities be incorporated into all programs and projects.

The PNLCD advocates a systemic view pairing the ecosystem and its resources with the primary production system including animal husbandry, agriculture, and wood harvesting (energy). It specifies that rural and urban systems must be viewed as linked in their exploitation and use of resources and that equilibrium must be sought for these paired systems.

In the attempt to grapple with specific environmental realities, the PNLCD proposes decentralization and regionalization, and supports long-range planning with the development of Master

Plans (*Schémas Directeurs*) at the national, regional, provincial, and departmental levels.<sup>8</sup> The PNLCD posits the requirement to redefine and reinforce at regional and provincial levels the roles and mandates of governmental institutions, developing coordinating mechanisms, and training adequate personnel.

Based on an assessment of problems and needs, the PNLCD makes a series of recommendations:

- Involve and educate the population and specifically women, bringing them to consider both immediate and long-range views;
- Develop a code for agro-sylvo-pastoral actions to fit each individual region;
- Produce integrated rather than sectorial plans;
- Seek methods to manage the problems of internal migration, land tenure, and the productive integration of transhumants;
- Intensify agricultural production for food sufficiency: introduce agroforestry, high yield varieties, irrigated agriculture, range management, and synergetic methods of animal husbandry;
- Combat erosion through use of soil and watershed control methods. Preserve and restore soils using compost, manures, agroforestry, and so on; and
- Develop forest reserves and wildlife protection zones.

CILSS's status assessment of Burkina's PNLCD depicts constraints encountered in the current picture: superfluous governmental structures are vertical, compartmented, and uncoordinated. There are insufficient funds and appropriate and trained personnel. Top-down planning, and lack of decentralization mean there are too many concepts at the national level, and inadequate, unrealistic operations methods at the base. In the absence of Master Plans, there are confusion, poor information, incoherent decisions, and redundancy. In particular, there is urgent need for better concertation between the Comité national pour la lutte contre la desertification, the Cellule nationale de gestion des terroirs villageois, and the Commission nationale de l'aménagement du territoire.<sup>9</sup>

Two final points regarding the CNLCD should be noted: the ministries of justice, health, finance, and economic promotion should logically and of necessity be integrated as members of the CNLCD, and the World Bank's July 1989 assessment of the institutions intervening in the environmental conservation campaign suggests that the CNLCD should cap and coordinate all such programs for better orientation toward the objectives of the PNLCD.

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<sup>8</sup> For example, Schéma national d'aménagement du territoire (SNAT), Schéma régionale d'aménagement du territoire (SRAT), and Schéma provincial d'aménagement du territoire (SPAT).

<sup>9</sup> Traore, S., July 1990; *Bilan analytique des projets et programmes relatifs a la gestion des ressources naturelles et a la lutte contre la desertification au Burkina Faso*. CILSS/Club du Sahel.

### **National Environmental Action Plan**

The National Anti-Desertification Committee is the coordinating element for the different technical ministries involved in the National Anti-Desertification Plan. It is also the mandated monitor of the SNAT<sup>10</sup> and all development efforts to assure compliance with environmental protection priorities. As such it is responsible for the coordination of plans at all levels into a National Environmental Action Plan which is to be the implementation program for the achievement of the PNLCD's strategic objectives.

Because the CNLCD has lacked adequate budget, personnel, technical assistance, and quarters to accomplish its monumental mission, it has received a UNSO (Swedish technical assistance) grant for first phase development of its administrative frame and technical assistance needs; and World Bank, with the blessing of CILSS and with support from Japan and a number of donors, has undertaken to assist development of the integrated Action Plan.

This long-range national plan will require major decentralization efforts across the ministries. It posits regularization of land tenure, and total mobilization of populations at the base of the pyramid. Its overall objective is to establish and maintain socioeconomic and ecological equilibrium.

The national plan proposes the following goals and subsequent programs:

- Conserve the natural resource base — water, soils, vegetation, and wildlife;
- Inform, organize and train rural peoples for environmental conservation;
- Open isolated areas to development, with due sensitivity for the environment;
- Contain and manage the problems of internal migration;
- Intensify and diversify both plant and animal production to achieve alimentary self-sufficiency in a sustainable system;
- Research hydrologic structures of Burkina Faso and develop a sustainable water system to meet agriculture, human and animal needs;
- Develop and effectively manage firewood and other fuels to meet national energy needs in a sustainable manner; and
- Develop and apply supportive research.

As means to achieve the above ends, the World Bank proposes the following first steps:

- Decentralize the government into the Ministry of Plan's proposed ten regions, creating a legislative base for this act, and the necessary structures at the regional level (Table 5);

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<sup>10</sup> Schéma national d'aménagement de territoire.

- Reorient certain ministerial mandates and programs (n.b. MET), and provide technical assistance, support and training to help them achieve efficiency;
- Top this structure with a reinforced CNLCD capable of directing/coordinating/monitoring environmental action;
- Integrate and reorient redundant structures;
- Align social and economic policy to further environmental objectives such as land tenure and pricing policies);
- Better utilize ideas and work coming from expert seminars;
- Employ the PNGTV as a vehicle to mobilize and orient the population at grass-root level;
- Develop the set of Master Plans (SNAT, SRAT, SPAT, SDAT, SVAT etc.) for development and land use planning; and
- Define and train necessary human resources.

#### **The Burkinabe Sahel Plan (PSB)**

Initiated in 1986/87 before elaboration of the national action plan, the Burkinabe Sahel Plan was the first test in Burkina of the CILSS/CLUB strategy laid out in Nouakchott in 1984 and incorporated in the Burkina Faso PNLCD. It constituted both an immediate response to rapidly deteriorating conditions due to drought, and an attempt at long-term environmental planning and action. The PSB is conceived in 20-year terms, cut into five-year phases. It covers the three Sahelian provinces of Soum, Oudalan, and Seno, and has been given a structure to encourage integration of inter-ministerial technical services, population activities, and donor interventions.

The Ministry of Plan Office of Development Planning (Service d'aménagement du territoire) established an inventory of needs, and a dossier of proposed projects that donors and other agencies might espouse. The first phase was configured as a pilot period to mobilize popular participation, and organize effective methods of coordination between all partners. The lead agency has been the German GTZ, with Italian efforts concentrating on research and trial interventions in pastoral systems (LUCODEB).

The PSB is important to the concepts proposed in this paper because it has developed the paradigm structures of decentralization and coordination now proposed in the PANE for the rest of the country. Most remote and poorest section of the country, and hardest hit by drought, the Sahel is also the first area where the PNLCD strategy has been applied, and as such offers a laboratory case where constraints, early successes, and shortfall may perhaps be studied. We recommend a further look at the PSB by the PID/PP Teams. (See Annex 1, Structure of the PSB as derived from World Bank/CNLCD Document of July 1989: *National institutions involved in natural resource management in Burkina Faso.*)



### **Tropical Forest Action Plan (PAFT)**

For Burkina, the Tropical Forest Action Plan is not a program in the sense of the PNLCD, or PANE, but rather a set of orientations. These are based on analysis of the status of the forest sector and related constraints, and they propose actions for effective sectoral management to be incorporated into PNGTV and NRM programs and projects. In line with concerns and thinking incorporated into the Tropical Forest Action Plan (international), Burkinabe action is guided toward:

- Development of forestry in land use planning;
- Institutional development for improved forestry planning and management;
- Development of forestry industries;
- Firewood production and resource management;
- Global conservation efforts for the tropical forest ecosystem, including wildlife, fisheries, medicinal and other useful plants.

PAFT conferences have made the following recommendations:

- Define an overarching strategy of the environment for the Ministry of Environment and Tourism;
- Design a program of institutional development and support for government agencies concerned in the management of natural resources;
- In land use planning and management, design all activities to protect and restore natural resources;
- In forest use planning and management, intensify use of both natural and introduced products;
- For the energy sector, combine effective management of existing resources with development of firewood plantations, and efforts to reduce the demand for firewood fuels; and
- Design conservation planning to maintain the equilibrium of the biome, preserve genetic diversity, and provide for sustainable use of the elements of the ecosystem.

It is expected that these principles will be incorporated into the national action plan.

### **Lutte Contre la Desertification au Burkina (LUCODEB)**

LUCODEB is a plan or program to support the three battles (*trois lutttes*). These are the fight against uncontrolled and destructive movements of herds in the bush, uncontrolled and abusive destruction of forest for fire-wood, and uncontrolled burning to hunt and to clear agricultural land.

Only the first of three planned phases has been undertaken, notably efforts in the six provinces of Yatenga, Sanmatenga, Namentanga, Passore, and Bam. Begun in 1986, LUCODEB was integrated into the CNLCD ambit in 1988, and has been largely supported by the Netherlands.

### **Institutional Issues: Roles and Mandates of Key Institutions Involved in NRM in the Region**

The following constraints are reported to characterize all ministries to one or another extent: There are too many and redundant programs, offices, committees, commissions, with no, or unrealistic budgets, no equipment, and insufficient human resources. These in turn make demands for an incoherent number of meetings and conferences which end in nothing, and project ideas without continuity or follow-through. We quote from a report of the "après-Segou" CILSS meeting:

Three big types of problems were qualified as central bottlenecks...weak institutional capacity, poor follow-through, and institutional habits and priorities which diverge from the strategy and objectives of the project.<sup>11</sup>

#### **The Ministry of Environment and Tourism**

The Ministry of Environment and Tourism is viewed as weak in organization, personnel, and training. Further, its priorities and accustomed emphasis on "policing" forest areas distract its agents from the wider and more productive tasks of management and development of productive forest lands. What is needed is reorientation, reorganization, and training of cadres to align ministry capacity with the vital task which the PNLCD mandate posits. A table of organization follows.

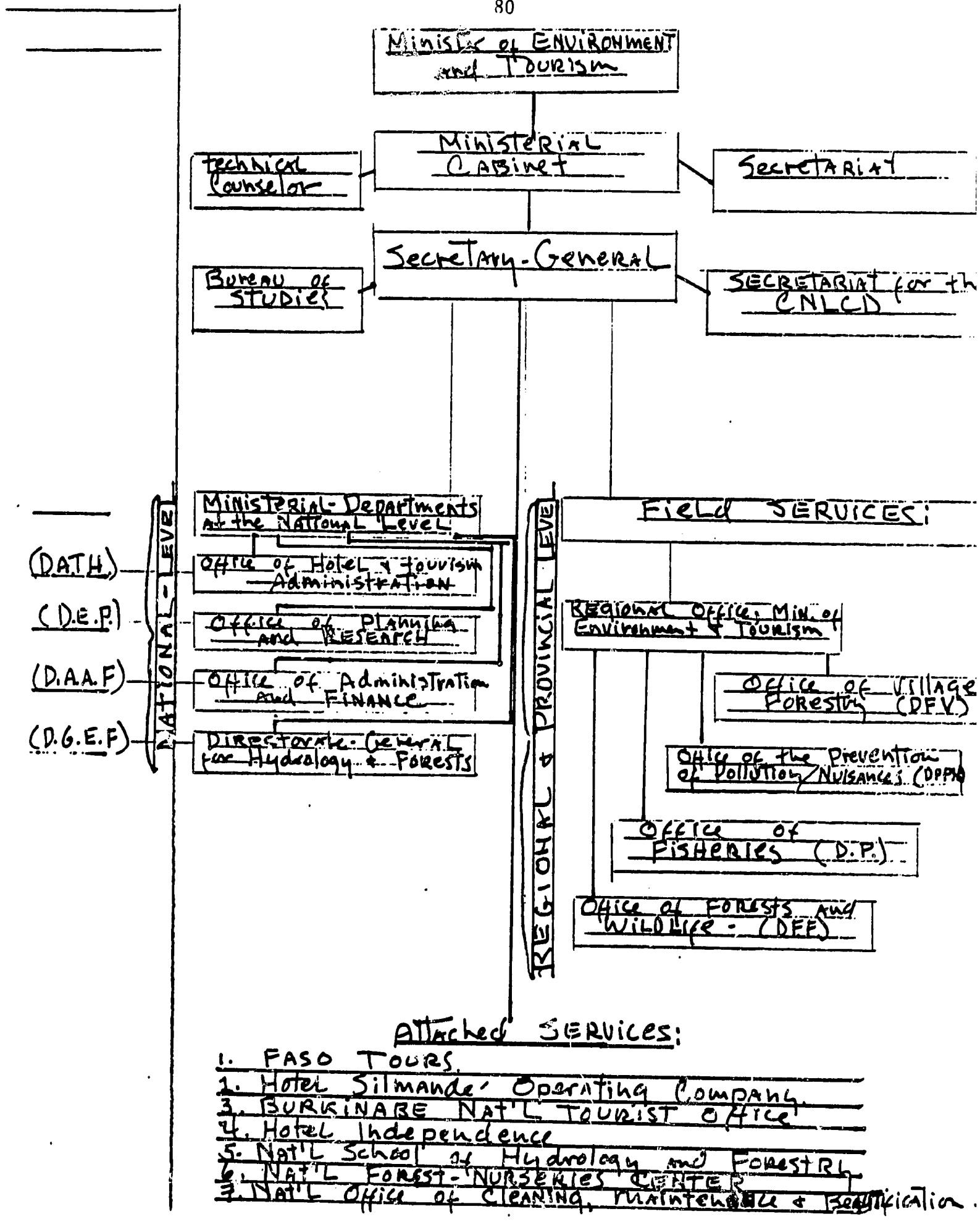
A current view of the strategy of the Ministry of Environment includes the following rubrics:

- **Development and regulation of forestry and tourism.** This includes zoning and management of village lands with diffusion of appropriate technology; development of classified areas; creation of village forests; organization and exploitation of marketable forest woods; development and exploitation of fuel-wood resources; and the development of tourist sites.
- **Development of National Parks and Wildlife Reserves.** Creation and development of the Comoe-Leraba National Park, the Bala National Hippo Pond; creation and management of a Wildlife Ranch; development of hunting for both subsistence and sport.
- **Campaign to control bush fires.** Includes mobilization and equipment of village anti-fire committees, and the development of a system of fire-breaks, as well as research on the use of backfiring.
- **Restoration of deteriorating lands and promotion of agroforestry.** Involves reforestation, soil and water conservation, development of marketable tree plantations, and introduction of tree species as wind-breaks, living hedges, forage and etc, into agricultural exploitations.

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<sup>11</sup> A. Sheik, October 1990 Report.

# TABLE of Organization of the Ministry of Environment and Tourism

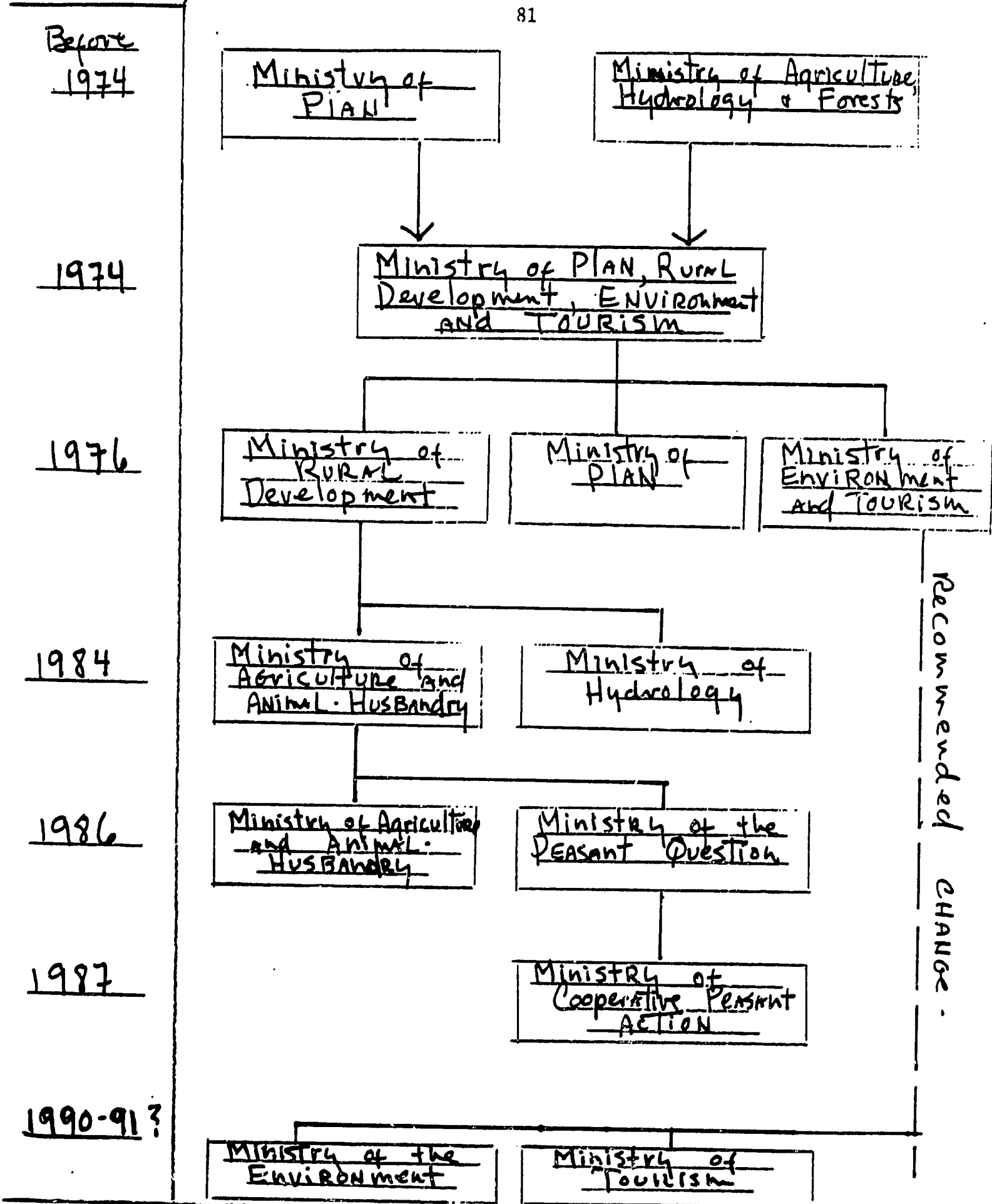


### Attached SERVICES:

1. FASO TOURS
2. HOTEL Silmande' Operating Company
3. BURKINABE NAT'L TOURIST OFFICE
4. HOTEL Independence
5. NAT'L School of Hydrology and Forestry
6. NAT'L FOREST-NURSERIES CENTER
7. NAT'L Office of CLEANING, MAINTENANCE & Sanitification

STUDY OF EVOLUTION OF THE MINISTRIES (1951)

From 1974,  
with Recommendation for change -



Recommended CHANGE -

N.B. TOURISM might become a service in the Ministry

**PART 2.****MINISTRY OF ENVIRONMENT INSTITUTIONAL ASSESSMENT,  
SUPPORT AND DEVELOPMENT.**

(NOTE: A full field assessment of the Ministry of Environment and Tourism was presumably carried out by UNDP in 1988, with a schedule of recommendations seemingly now being developed. The Concepts Team suggests that the Mission &/or the PID Team pursue access to this report as a basis for MET reorientation and reorganization planning.)

- **Promotion of fuelwood economies such as improved stoves, search for wood-substitute fuels, and use of compressed-straw bricks.**
- **A set of Activities to include:**
  - **Yearly mapping of burned zones to permit tracking of bush-fire degradation;**
  - **An inventory of hunting sites to encourage safari tourists and a campaign to increase big-game tourism;**
  - **Environmental awareness education through all media;**
  - **Organization of national seminars on the environment for target audiences;**
  - **Extension of the national program to create more reserves;**
  - **Wildlife Inventory;**
  - **Household Energy Study; and**
  - **Training and retraining of forestry and tourism personnel both long and short term.**

### **The Ministry of Plan**

#### **Elements in the Minplan Concerned with NRM:**

- a) **Minister and Delegates on the CNLCD.**
- b) **Agrarian and Land Tenure Reform (RAF).**
- c) **Directorate for Territorial Development (DAT):<sup>12</sup>**
  - National Commission (CNAT);**
  - Technical Commission (CTAT);**
  - Provincial Commissions (CPAT).**
- d) **Regional Directorates of the MinPlan (10).**
- e) **Provincial Directorates of the MinPlan (30).**

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<sup>12</sup> **Direction d'aménagement du territoire.**

DIRECTIONS REGIONALES DU PLAN ET DE LA COOPERATION  
(DRPC)

CHEE-LIEU	:	ESPACES GEOGRAPHIQUES CONCERNES
1. Dédougou	:	Mouhoun Sourou, Kossi
2. Dori	:	Séno, Oudalan, Soum
3. Fada N'Gourma	:	Gourma, Gnagna, Tapoa
4. Kaya	:	Sanmatenga, Bam, Namentenga
5. Koudougou	:	Boulkiemdé, Sanguié, Sissili
6. Ouahigouya	:	Yatenga, Passoré
7. Tenkodogo	:	Boulgou, Kouritenga
8. Gaoua	:	Bougouriba, Poni
9. Bobo-Dioulasso	:	Houet, Comoé, Kéné Dougou
10. Ouagadougou	:	Kadiogo, Nahouri, Zoundwéogo, Ganzour- gou, Oubritenga, Bazèga

f) **Office of Land Allocation:**

At Provincial, Departmental, Commune, and Village levels:

Land Distribution Commission, Land Evaluation Commission, and Litigation Commission.

g) **Five Year Plan (PQDP):**

Sectorial Commissions for Plan development;  
 Provincial and Departmental Councils for Plan development;  
 At National, Provincial, Departmental, and Village levels: PLAN coordinating and monitoring units.

f) **PNGTV:**

National Coordinating Unit;  
 Village Management Committee.

### **The Ministry of Agriculture and Livestock Husbandry**

Agriculture and livestock husbandry provide employment, sustenance and income for 90 percent of Burkina's population. Agriculture contributed 39 percent of GDP (1989), and of that, 25 percent is attributed to the livestock subsector. Ministry of Agriculture structures most closely involved with new orientations toward environmental conservation are the PATECORE<sup>13</sup>/PNGTV pilot test zones, and CRPA<sup>14</sup> technical services offices, now distributed in 12 distinct MinAg-defined regions.

It should be noted that the PNGTV has been lodged institutionally in the Ministry of Plan, but in the new World Bank Environment Project, much of the burden will be transferred to the Ministry of Agriculture and the CRPAs. These changes flow from experience in the pilot phases of PNGTV test-villages.

### **The Volta Valley Authority (AVV), and Migration**

For exhaustive development of the Volta Valley Authority experience and associated patterns and trends of internal migration and the agricultural behaviors involved, the reader is referred to the IDA<sup>15</sup> paper by Della MacMillan, et al., *Onchocerciasis Control Programme Land Settlement Review: Burkina Faso Case Study*. This should be required reading to understand mechanics and subtleties of migration and resettlement problems, and the integration of new settlers with indigenous people. These are complicated

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<sup>13</sup> Projet d'aménagement des terroirs et conservation des ressources dans le plateau central.

<sup>14</sup> Centres régionaux de promotion agro-pastorale.

<sup>15</sup> Institute for Development Anthropology.



LES DOUZE (12) C.R.P.A.DUMINISTERE DE L'AGRICULTURE ET DE L'ELEVAGE (MARS 1988)

CHEF-LIEU	:	ESPACES GEOGRAPHIQUES CONCERNES
1. Dédougou	:	Mouhoun, Kossi, Sourou
2. Dori	:	Séno, Oudalan, Soum
3. Fada N'Gourma	:	Gourma, Tapoa, Gnagna
4. Kaya	:	Sanmatenga, Bam, Namentenga
5. Koudougou	:	Boulkiemdé, Sanguié, Sissili
6. Ouahigouya	:	Yatenga, Passoré
7. Koupèla	:	Kouritenga, Boulgou
8. Diébougou	:	Bougouriba, Poni
9. Bobo-Dioulasso	:	Houet, Kéné Dougou
10. Ouagadougou	:	Kadiogo, Bazèga, Oubritenga, Zoundwéogo <i>Gingouy</i>
11. Banfora	:	Comoé
12. Manga	:	Nahouri, Ganzourgou <i>Zoundwéogo</i> <i>Bazèga</i>

and very important issues and must be resolved in the approach to each individual village population. The AVV village experiences provide a textbook of case studies.

The Ministry of Agriculture will probably be brought ultimately to redefine its regional system following the expected general pattern, but there may be a considerable time lag. See Table of Organization that follows.

### **The Ministry of Cooperative Peasant Action**

This ministry split from the Ministry of Agriculture and Animal Husbandry in 1986 as the Ministry of the Peasant Question, and was renamed in 1987 Ministry of Cooperative Peasant Action. Perhaps because this is a new branch of government, table of organization and mandate for this ministry were not available at the time of the Concept Team's visit. We recommend that the PID Team or the Mission make another attempt to obtain this information. This is the ministry with which the NRM Project will work most closely in mobilizing village group development and skills.

### **The Ministry of Territorial Administration**

This would be the ministry of interior elsewhere. Definitional administrative units are: Village, Commune Section, Commune, Department, and Province. (Regional offices will probably be added in line with new decentralization measures.) The administrative hierarchy is coordinated through the National Office of Coordination of Popular Structures (CNSP).

Authority at the lowest level is the Village Revolutionary Council, chaired by the Delegate, and including committees of Youth, Elders, Women, and Farmers. Any permanent agglomeration of 100 inhabitants, or minimally 20 families, at 5 km. distance from another community, may be designated as "a village."

At the commune level, official power is channeled through the Commune Revolutionary Council presided by the Mayor. Any residential and economic agglomeration with population of 3000 people may be named "a commune." The unit at this level is a legal entity, and disposes of a budget and financial autonomy. It may include several communal sectors (wards). All provincial capitals are "communes", but other large communities may aspire as well.

The department consists of at least 5 villages with a population of 10,000 inhabitants. It is directed by a *Préfet* who heads the Departmental Revolutionary Council, and consults with a General Assembly nominated by the Council.

Revolutionary government, party, administrative and ministerial offices and services at the Provincial level are chaired and coordinated by the High Commissioner, the highest authority in the Province. He represents the State, the Party, the Government, and each Minister. He is responsible for all development and natural resource conservation in his domain. The Province has also a legal personality, and financial as well as budgetary autonomy.

**Administrative Sectors in Areas Concerned by NRM Project**

<b>PROVINCES</b>	<b>DEPARTMENTS</b>
<b>COMOE</b>	Banfora
Capital: Banfora	Beregadougou
	Dakoro
	Douna
	Kankalaba
	Loumana
	Mangodara
	Moussodougou
	Niangologo
	Niankorodougou
	Sideradougou
	Sindou
	Soubakaniedougou
	Tiefora
	Wolokonto
	Ouo
<b>HOUET</b>	Bekuy
Capital: Bobodiolasso	Bereba
	Bobodiolasso
	Fo
	Hounde
	Koumbia
	Lena
	Peni
	Satiri
	Toussiana
	Bama
	Karankosso-Vigue
	Kourinion
	Padema
<b>KENEDOUGOU</b>	Djigouera
Capital: Orodara	Koloko
	Kourouma
	Morolaba
	N'dorola
	Orodara
	Oueleni
	Samoghohiri
	Samorogouan
	Sindo

*Academic activities*



## INERA, IRBET, and the USAID ARTS Project

USAID's Agricultural Research and Training Project (ARTS) has been developed to help the GOBF confront the long-term decline in the Burkinabe agriculture sector. The project strategy involves a) human resource development, b) field research activity support, and c) program research management support. The project is designed to enhance development of a national farming systems research capability, and will work most closely with the National Agricultural Research Institute (INERA), and its subsidiary programs<sup>16</sup>, which has the national mandate to coordinate and implement all in-country agricultural research.

The ARTS Project will work in two priority regions, the Mossi Plateau (central region), and the southwest, viewed as the region with the greatest agricultural potential. Under the INERA/RSP program,<sup>17</sup> the project aims to build and strengthen two teams based respectively at Kamboinse and Farako-Ba. The project will encourage Ouagadougou University faculty involvement and collaborative research, and intends to support and strengthen existing research program and management structures such as IRBET. A project goal is the incorporation of research results into national level food and agriculture policy decisions.

Project activities include long-term training to improve professional agricultural research capability. Short-term, in-country training will take the form of short courses, seminars, and workshops. Farming systems research methods, techniques, and computer and applications program training will be provided for selected staff. Goal of this effort is to establish within INERA a competent group of research scientists and staff, able to identify, design and implement policy-relevant research.

Three long-term Technical Assistants will work with the two field teams in planning, research, and data analysis. They are respectively an agronomist, an agricultural economist, and a rural sociologist. Short-term consultants will support data analysis, and training in agroforestry, animal science, rural sociology, and anthropology.

The ARTS Project Team arrived in July 1990, and spent the first trimester settling in and planning. Activities planned for the first phase include design and implementation of farmer opinion surveys, marketing studies, studies of the organization of production, and study of land-tenure practices and policies. Further work will concern agronomic extension evaluation, study of forage crops for animals, data gathering on household budgets and consumption, and work with women.

It is evident that the ARTS Project and the NRM Project will intersect continually and at many levels. PID/PP Teams will need to coordinate planning closely for synergistic use of resources.

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<sup>16</sup> INERA is institutionally lodged in the Ministry of Higher Education and Research (MESRES). IRBET is the INERA institute for biologic and environmental research.

<sup>17</sup> Production Systems Research Program.

### **The Burkinabe Geographic Institute**

A National Cartography Commission was established in 1989, and a Conference held in May of that year to start work on a Master Plan (*Schéma Directeur*) for regional mapping of Burkina Faso. In the World Bank Environment Project now in gestation, there are further plans to strengthen and develop the Burkinabe Geographic Institute and its map-making capability. Obviously mapmaking skills will be of primary importance in the zoning and creation of land use management plans for the *terroirs*. (Burkina has about 7,400 villages).

The World Bank project also intends to create and support a Geographic Institute capability to use remote sensing products to monitor environmental status. It should be noted that the National Commission for Cartography and the National Commission for Spatial Activities are institutionally lodged in the Ministry of Equipment.

## **MAJOR DONORS ACTIVE IN NATURAL RESOURCE MANAGEMENT IN BURKINA FASO**

### **Multi- and Bi-lateral Donors**

In 1985, impetus to develop an overall environmental strategy for Burkina came through CILSS and the Club des Amis du Sahel. The first result in 1985/86 was development of the PNLCD. Under World Bank aegis, and with research money and support from Japan, Germany, Italy, Norway, CIDA, Caisse Centrale, and UNDP, an integrated Environmental Action Plan (Plan d'Action Nationale pour l'Environnement, PANE) will soon be presented to extend and support implementation of the PNLCD.

Some donors have concentrated their environmental concern in specific sectors. Thus, the German component of CILSS has been the lead donor in the PSB (the Sahel Program) and Italian aid is financing research on range management and nomadic pastoral systems. The French (Caisse Centrale), have worked closely with land management systems in the context of the pilot PNGTV villages, and Canadian (CIDA) efforts have dealt with small projects disseminating improved fuel-use cookstoves. The Swiss, Dutch, Germans, Americans, Canadians, Swedish, Danish, and Norwegians have all financed forestry, fuel-wood and/or agroforestry development. UNDP supports environment-sensitization education campaigns. IUCN,<sup>18</sup> FAO, the Canadians, Dutch, and Americans have all worked for wildlife management and conservation and to establish national parks and game reserves. In 1986, the need for more village water points by 1990 was estimated to be 23,140. The water program has engaged the efforts of the CCCE, FAO/Italy, the Saudi Fund, UNICEF/UNDP, FED, KFW, and CIDA/Caritas.

Only in the Sahel project has the need for a formal donor coordinating mechanism been addressed, by the creation of a Coordinator position. But the National Coordinator within the CNLCD is projected to fulfill this function at a wider level in the new *gestion de terroirs* efforts. Formal donor coordination is also hoped-for in the projected regional coordinating committees. Lack of donor coordination is a serious problem for Burkina, which needs realistic and synergistic efforts to help in its battle against the desert. Better donor communication could make for much better calibrated efforts at the local level.

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<sup>18</sup> International Union of Concerned Nations.

At this writing, there is no available roster of total donor activities in Burkina Faso. The following is drawn largely from the PNGTV review document of May 1989, and from people's memories.

#### Partial List of Donor Activity and Location

PSB:  
 Oudalan: GTZ, CILSS, UNSO, The Netherlands  
 Soum: GTZ, CILSS, WB pilot project in agropastoralism  
 Seno: GTZ, CILSS

Yatenga: FED, FIDA, 6th program of FED  
 BAM: GTZ, Patecore; FIDA  
 Sourou: FED, FIDA, CCCE  
 Passore: FED, CIDA: Vegetal Ground-Cover Project of Passore.  
 Sanmatenga: FED Patecore  
 Namentenga: FED Patecore  
 Gnagna:  
 Tapoa: CCCE  
 Gourma:  
 Kouritenga: CID (Italian) agropastoralism, WB PNGTV ph2..  
 Boulgou: CID, agropastoralism  
 Ganzourgou: CCCE (AVV UP3 at Zorgo, cotton)  
 Zoundweogo:  
 Naouri: ACDI  
 Sissili: FED; CCCE at Fara-Poura; Netherlands stock ranch;  
 Bazega:  
 Kadiogo: FAO, Forest Reserves  
 Oubritenga:  
 Bulkiemde: UNSO, Group Wood Project, SIDA, improved stoves.  
 Sanguie: UNSO " " " " " "  
 Mouhoun: CCCE  
 Bougouriba: GTZ, UP10 AVV  
 PONI: AID, GTZ, UP10 AVV  
 Comoe: FAO, Forest of Toumousseni; SIDA, improved stoves.  
 Houet: CCCE; FAO apiculture; Netherlands, Forest of Kou/rice  
 Kossi: CCCE  
 Kenedougou: WB PNGTV ph2

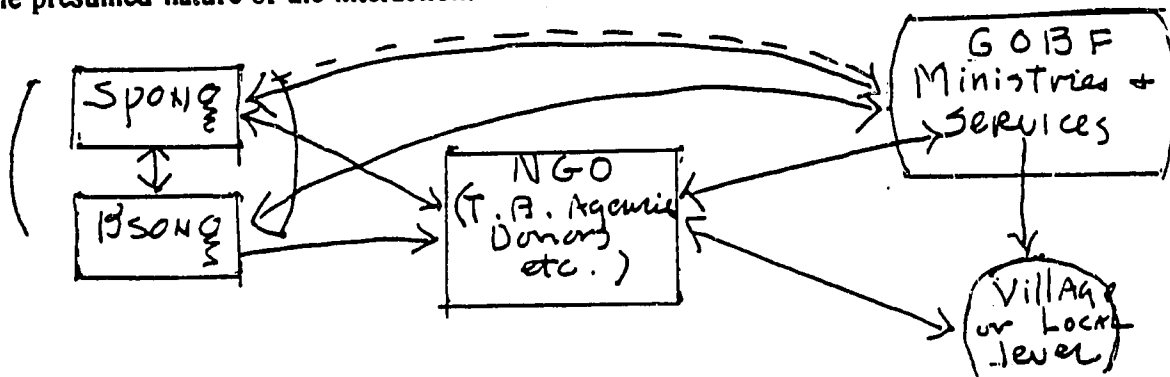
*(Patecore: Projet d'aménagement de terroirs et de conservation des ressources du plateau central Mossi. n.b. CIDA is also at Nazenga).*

#### Nongovernmental Organizations

In 1988 Burkina Faso counted 94 NGOs, the earliest dating from 1959, and the majority from the '70's, period of the first major drought in the Sahel, though the 1980's saw continued augmentation.

Of this number, roughly 33 percent were Burkinabe, 17 percent were French, 13 percent were American, and 37 percent were of other national origin, or international in character.

In 1975 a permanent secretariat of NGOs (SPONG)<sup>19</sup> was established by the NGO community to serve the ends of communication and eventual coordination. Subsequently the GOBF created an office in the Ministry of Plan (BSONG)<sup>20</sup> to liaise with and monitor NGO action. The following sketch shows the presumed nature of the interaction.



Some voluntary organizations are local in nature, and work only in one province, while others are countrywide. NGOs in Burkina have worked in the following sectors:

Agriculture, agricultural credit, animal husbandry, antierosion, antidesertification, artisanry, crop storage, community development, dams, large and small disaster relief, education, food aid, nutrition, forestry and reforestation, health and health education, improved stoves, institutional support, road construction, integrated rural development, small projects, village mills, hydraulologic research, water wells, urban and rural potable water systems, and livestock water.

The Natural Resources Management Concepts Team proposes in this paper that USAID's NRM Project be mounted by and through a NGO. This NGO will need to establish and manage the project headquarters at the regional level, with all that entails. It will also need to intervene at the village level directly in activities to train local people, and develop cooperatives, small enterprises, and income generating activities. It is believed that the three most promising organizations would be, in priority order: CLUSA, OXFAM GB, or AFRICARE.

AFRICARE was established in Burkina Faso in 1974, and has worked in the provinces of Bam, Bougouriba, Mouhoun, Oubritenga, Passore, Poni, Sanguie, Sissili, Sourou, Yatenga, and Zounweogo. Most recently it has completed a modest forestry project in Poni, about which opinions are mixed. AFRICARE's Burkina experience has involved agriculture, forestry (reforestation), rural roads, rural wells, livestock, and water-harvesting efforts (anti-erosion).

OXFAM GB came to Burkina in 1968, and has worked in all but six provinces. It presumably has not worked in Houet, Comoe, or Kenedougou. Activities have included but are not limited to

<sup>19</sup> Secrétariat Permanent des organisations non-gouvernementales.

<sup>20</sup> Bureau de suivi des organisations non-gouvernementales.

agriculture, village mobilization and training, disaster and food relief, health and health education, and water-harvesting and anti-erosive efforts. OXFAM's name is very good in Burkina.

CLUSA is newly opened in Burkina Faso, but has had a signally strong record in the Sahel in Niger and Mali. It has worked in over 40 Third World countries since 1954. Although its program is largely focussed on development of autonomous cooperatives at the local level, in several countries CLUSA's institution-building efforts at other government levels have permitted market-oriented, unsubsidized local organizations to develop and operate as successful business ventures.

Clusa has experience with agricultural production, processing, and marketing; farm-inputs supply and distribution; crop storage; fisheries; rural industries; cooperative banking and credit, insurance; organizational development; and management training. It trains local people in literacy, numeracy, operational, organizational, financial and managerial skills, and then helps develop business and income-generating activities to address social and economic needs.

We have contacted CLUSA's African regional Director, who is prepared to determine whether CLUSA could undertake the full project, or only village-level activities. This could be further explored by PID or Project Paper Teams if the Mission desires.

A full roster of NGOs associated with SPONG is included in Annex 2.

## **CONSTRAINTS**

### **Land Tenure and Agrarian Reform**

Competing historic systems of land tenure complicated by Sankara regime land-reform legislation and major migration phenomena linked to drought and climate change, have created a complex, interlocking set of problems for Burkina Faso which pose an immediate threat to her environment. The keystone in this complex is ambiguity in landholding practice and concept.

Layered and competing systems of land tenure have created confusion about the means of access to productive land. Insecurity about continued use-rights, and rights to the fruit of labor, now robs rural people of their sense of responsibility for the fertility of their soils and the viability of their environment. Lack of authority over their lands leaves them vulnerable to the excesses and exploitation of outsiders.

### **History**

In West and Sahelian Africa there is no "unowned" land. All land is conceived as "belonging" (in the sense of rights of first ownership) to some group or sub-group of a named people. There is land that has been sparsely populated, where the perceived availability of new fields allowed longtime fallowing of marginal and exhausted farmlands. At low levels of population, this permitted an equilibrium to function in which autochthonous owners, transhumant herders, and limited numbers of in-migrants could be accommodated without concomitant destruction of the soils and environmental base. A safeguard to the delicate balance of this system lay in traditional modes of gaining access to productive land.



Contrary to general belief, onchocerciasis-infested areas of the Volta rivers watershed were not "empty" and unowned. Reality paints a much more subtle picture, in which the prevalence rate of endemicity within a relatively small local exposed population sometimes reached levels which pushed the population to further decline for both health and social reasons. It now appears that when densities of inhabitation dropped to a threshold of 35 inhabitants per square km in heavily similium (fly vector) infested zones, an intolerable prevalence level of the disease brought about desertion of the site. However, larger population can lower the ratio of persons-to-infected bites, and a population — even living astride the river — may thus present socially inapparent levels of the disease, permitting continued occupation of onchocerciasis threatened lands. There is the suspicion that other endemic diseases (trypanosomiasis) may play a role in what has been fluctuating human movement into and away from affected areas over time, by ethnic groups which conceive of the Volta watershed as their territory.<sup>21</sup>

## Land Tenure Systems

### Traditional Land Tenure and Land Use

Traditional patterns of landholding and authority over the use and disposition of land emphasized social and ritual rather than money-based modes of access and ownership.

In the typical West African complex, the first comers to move into and begin to use the land of an area have been conceived as having established a ritual relationship with the spirits and mystical forces at home there, and with the land itself. In time, the lineages descended from them are believed by themselves and others to mediate human interests with the metaphysical powers that attach to these lands. Generally, the most senior member of the lineage is the ritual *chef de la terre*, or Land-Priest, and holds authority to dispose of land within this "homeland". As lineages bifurcate over time (i.e. A has two sons, who each found families which in the course of several generations will produce several different collateral lineages), a kin-group is formed, which will collectively have rights of access to productive land within that homeland. Over time, different lineages come to have "individual" group rights to exploit certain areas, use-patterns differing with variation in group social organization. But as McMillan tells us,

Despite certain differences in application...., one encounters the same three basic categories of land tenure rights in all of the river basin populations. The essential characteristic of all three categories is that they do not allow for ...private land ownership. Instead, all three safeguard the inalienable collective rights of individual lineages or extended kinship groups. This collective system does not exclude migrants, as long as the migrants are willing to respect the customs and traditions of the local social groups.<sup>22</sup>

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<sup>21</sup> See for example, Prost, Hervouet, et Thylefors, *Les niveaux d'endemicité dans l'onchocercose*, Bulletin de l'Organisation mondiale de la Santé 57(4): 655-662, 1979.

<sup>22</sup> McMillan, Nana, Savedogo, *Onchocerciasis Control Program: Land Settlement Review, Country Case Study: Burkina Faso*, IDA, 8/90 Draft.

Because groups do not live in isolation, newcomers from the larger kin-group may appear, as may members of other intermarrying families. Migrating members of other ethnic groups, ambulant merchants, war-captives, slaves, occasional poor transhumant herders may all arrive to swell the community over time. Access to land, the basis of subsistence, was traditionally sought from the land-priest, and through this mechanism, newcomers could be integrated into the local group, and vital access to land achieved.

But newcomers were always (even over generations) considered to "borrow" the land, which was conveyed with a limited set of rights. An example: An "owner" settles in to land by planting the trees which the central fetishes, spirits, metaphysical protectors will inhabit. A "borrower" does not presume to plant these trees, though they might otherwise be economically productive (such as fruit trees).

Where land had dual use by different groups, as in the seasonal passage of nomadic herders over lands within the farmers' homeland, when low population levels left much land unused or in fallow, accommodation between the groups was achieved in a variety of ways. Institutionalized relationships involving exchange of goods and services, stylized types of interpersonal behavior ("joking relations"), and forms of patron/client or other symbiotic interaction often permitted conflicting needs to be resolved short of conflict. Unused land permitted passage of Fulani herders and their cattle; exchange of animal goods for farm products diversified the economies of both nomad and sedentary farmer; types of contract saw Fulani herding animals for farmers, and Fula herds fertilizing post-harvest fields as they grazed stubble. Mobility allowed nomad herders to cope with the yearly and cyclical vagaries of these marginal latitudes; and the dry season, or bad years found Fulani and their herds deep in the southern corridors as far as Ghana or the Ivory Coast, by way of the valley of the Mouhoun (Black Volta).

**This system of social accommodation and integration maintained functional equilibria within a relatively narrow set of limits, elements of which included relatively low population densities, high ratio of land to occupying population, neolithic modes of subsistence farming generally characterized by shifting agriculture and long periods of fallow, although differing land-management practices were followed by different ethnic groups.**

As illustration, politically decentralized southwestern peoples such as the Bobo Uele (Bwaba), Lobi, and Birifor developed soil-protective practices which enabled them to farm the same fields continually for up to forty years.<sup>23</sup> In contrast, Mossi from the centralized societies of the plateau used slash and late-season-burn methods which degrade and strip the land of vegetation. Over many years, the Mossi developed land use customs that involved short term intensive exploitation and stripping of their agricultural land, followed by continuing waves of out-migration and "conquest-by-saturation" of bordering areas. During the boom period of the Ivory Coast economy, Abidjan absorbed much of this energy. With economic decline in Abidjan, returning Mossi increasingly revert to old patterns of wave-like migration into the richer less exploited regions of the southwest.

Balances in the old system are thrown radically out of order with increasing population and heightening population density, increasing rarity of available land, and changes in farm technology from the limited intensity and extension of archaic systems to augmented intensity and extension due to modern

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<sup>23</sup> Personal communication from J.P. Hervouet, Geographer and Maitre d'Etudes for ORSTOM, Bobo Dioulasso.

inputs and animal or mechanized energy multipliers. And this has occurred against the background of major climatic shift beyond the fluctuations of previous years.

### **Land Tenure and Use in the French Colonial Period**

The French colonial regime, with its goal of restructuring and "organizing" development of the territory, introduced the concepts of private property, cadastration, public property, and the eminent domain of the State over "vacant and unowned land." Legislation and administrative practice concerning land were to be deployed as tools to rationalize the economy of the colony. But the need to accommodate to the realities of customary law led to mixed applications in administrative practice and a record of divergent court decisions which in fact validated now one, now another conflicting French or indigenous concept and principle of land tenure.

Oriented to the production of marketable surplus and the valorization of colonial property, the French colonial administration of the middle 1920s ordered the doubling of all agricultural land in use, and the obligatory planting of cotton. Across the Sahel, cotton was to become the cash crop, and feed raw materials to the French textile industry. This was a novelty not only in crop and cultivar, but for people of the Volta basins a radical innovation in concept of the uses and returns to be had from agricultural land. With one stroke, conceptually, land, land use and land-product entered the market as commercial goods, a radical departure from the concept of a ritualized life-support base with which the social group maintains religious ties. For many Burkinabe, cotton has since become "indispensable," the "motor" to other economic development. Combined with higher energy levels of technology, this has led to both more extensive and intensive land use, too often with little or no scruple for the restoration of nutrients pumped from the soils. As consequence, over time the center of cotton agriculture has migrated, leaving overpopulated, depleted land behind, from the central plateau to the upper Mouhoun area, to Kossi province, and now toward Bobo Dioulasso.

### **Land Tenure in the Period Following Independence**

In the period following Independence, (c. 1960), the Upper Voltan Government reiterated the principle of residual state ownership of land. In 1974, aiming to develop land of the Volta River Valleys liberated through the Onchocerciasis Control Program, all precedent land claims in the AVV (Autorite des Vallees des Voltas) areas were declared null and void. The Volta Valleys Authority was given sole agency to distribute and ascribe land access and land-rights in the region, in a scheme of planned settlement and development.

The result was mixed, differing from settlement area to area, as described in the literature. For our purpose it is enough to say that the layers of conflicting land tenure principles impacted communities differently, depending on the composition of individual settlements. Generally, where indigenous members outnumbered migrants, or where migrants came in small, digestible groups and particularly where respect to traditional "owners" encouraged comity, both social and economic integration followed. In any event, both planned and spontaneous settler groups entered the area and ultimately overwhelmed the mechanisms of the Authority. Where only the land attribution authority of the AVV validated settlement groups, ambiguity and conflicting land claims sometimes came to test in the courts.

### **The Sankara Government, and the Réforme Agricole et Foncière (RAF) of 1984**

A year after taking over the government, the Sankara regime promulgated the Land Reform Act in ordinances 84-050/CNR/PRES, and 85-404/CNR/PRES. This involved the ascription to the state of all landrights (nationalization), with separate regimes to govern urban and rural property. The urban rubric provided for state ownership, with usufruct rights to the dweller ("jouissance").

Sections of the Reform Act dealing with rural rights created the Domaine Foncier National (DFN) which retained all ownership of land in the name of the state. Usufructuary rights were to devolve on whoever clears and works the land. Authority was to reside at the local level in a Revolutionary Committee. Decentralization, regional land use planning, self-help, self-financing, and support from the technical services of the Ministries were to increase rural production and lead to food self-sufficiency.

Since constant usage became a condition to retain use-rights, it mitigated against the necessary practice of fallow. Insecurity over the future of their tenure demoralized farmers across the country, and different interpretations of this law led to conflict between lineages, between indigenous and migrant groups, between generations when impatient youth saw loss of authority by the old Chiefs.

Intended to regulate the management of all rural resources: land, water, forests, wildlife, agriculture and animal husbandry, the RAF has proven too ideological and insufficiently realistic to accord with the needs of society or ecology. It is now widely believed that reform of this Reform must take place as the essential prerequisite to motivate rural occupants to conserve the biome.

#### **Lessons Learned**

The AVV experience and other pilot efforts have clearly shown the effects of confusion between tenure systems. In the aggregate, the trend has been toward devaluation of traditional relationships, loss of symbolic and ritual connection to the land, bypassing of the old measures for social integration, and increased hazard of social and economic conflict. In-migrants without roots to integrate them socially, or to attach them to the land now often come only for a time or a season "to exploit" land (usually for cash crops) and then move on or return to their homeland. Without the ability to control and manage their homeland, indigenous rural people sense little responsibility for their environment.

The combination of a development-oriented emphasis on production, with a complex of faulty land use behaviors including clear-cut slash and burn, no rotations, insufficient time/land for fallow, plus ever narrowing climate constraints, has led to rapid degradation of the land. Add to this population growth (the Mossi birth rate is calculated at 3.3 percent) and regional economic conditions which constrain the old outlets for labor emigration. Results of this nexus as now seen are:

- Out-of-control migration, land-grab, land-stripping, ever-larger exploitations with mechanized agriculture to create the cotton cash-crop;
- Inability to fallow good lands or poor which are in steady use, soils degenerated, forest and vegetation lost, watershed in jeopardy;

- No room left for seasonal or emergency pastoral migration, hence much more conflict between herders and farmers. Climate degeneration in the north, and settlement conditions toward the south leaving no room for pastoral people;
- Government settlement plans and structures overwhelmed. Total confusion about land access and "ownership" security leading to increasing conflict, lack of responsibility toward, and investment in the land; and
- A repetitive process as exploitation-patterns in the North West, plus still degrading conditions in the Mossi homeland, plus demographic pressure, now catalyze more settlement to the southwest.

### **Needs and Policy Implications**

The Government of Burkina Faso, well aware of the problems posed by the current land-tenure situation, plans to hold a high-level interministerial conference with the aim to clarify the competing systems and claims. It will, in short, need to:

- Define what is in the "ownership package" in a manner which can restore continuity and security to rural inhabitants; to clarify how many kinds of "ownership package" there can be, and to empower authoritative mechanisms which can assign these use-rights to land. (viz., Land tenure commissions at the regional or provincial level);
- Decentralize authority and reorient government agencies to provide infrastructure and technical services able to guide migration, settlement, conservation, and development;
- Assign control and reinforce responsibility over land at the local level, to permit people to manage and conserve their own resources; and
- Create and implement a framework in which all levels of action: national, regional, provincial, and local can be brought to bear to preserve and recuperate the environment which is — as African traditions have long understood — the subsistence base for life. Government, World Bank, and various members of the donor community now hope this may be achieved through the PANE and the PNGTV. Villageois).

### **Policy Implications for USAID**

USAID should consider the following as conditions precedent for involvement in a natural resources management project in Burkina Faso:

- The Government of Burkina Faso should have taken, or be prepared to take significant land reform measures to assure security of occupation and usufruct to rural dwellers. USAID may regard this as a process that can be accomplished in part through the mediation of the intended project. Therefore, a pre-project study involving review of current national policy and intentions, and field survey at the local level should be undertaken under auspices of the Land Tenure Center;

- **The Government of Burkina Faso, following the principle of decentralization, should have created and mandated necessary agencies to provide infrastructure and technical services to guide migration and reinforce development and natural resource conservation. USAID should plan to give institutional development support to appropriate agencies.**

### **Institutional Absorptive Capacity**

A further constraint is in institutional absorptive capacity. The next phase of the French PNGTV project in the southwest and the World Bank Environment Project, as well as smaller bilateral efforts in the region, will place considerable pressure on the limited cadres of the ministerial technical services. This should be taken into account in human resource development and training plans of the NRMS project, and in planning for implementation work load. This question, and specific project design responses to it, should be part of the design teams SOW.

### **Water**

UNICEF/UNDP, the Netherlands and others are doing research and developing plans in response to water scarcity issues with the Ministry of Water. In a complementary approach, the USAID NRM project will concentrate on protection of the forest and vegetative cover, and the restoration of soils. This project aims to protect and restore the watershed and aquifers. The construction of infiltration ditches and contour dams and damlets for soil and water control will provide elements of erosion control and watershed improvement fundamental to work in the *terroirs*.

Nevertheless, water is one of the major constraints of the region, and water management a fundamental goal of the fight against encroaching desert. We therefore recall here the recommendations proposed at Nouakchott in 1984, with the understanding that these are counterpart measures to all the NRM project will hope to accomplish.

- **Need to establish a national Water Plan and Water Code. (A Netherlands project is working to this end);**
- **Need to establish a national Water Board (Council);**
- **Need for general review of water legislation, regulation and planning system;**
- **Necessity for systematic potable and agricultural water planning and management in the rural zones; and**
- **Necessity to review and rethink regulations, provision, and management of water for pastoral uses.**

## **PROPOSED PROJECT STRUCTURE**

The team suggests the following project structure for either of the substantive approaches proposed by this report. The NRM project will be formatted as an NGO activity, with all structures and personnel located and working at regional, provincial, and local levels in the southwest. The Concepts Paper proposes possibilities of working in the provinces of Houet and Comoe, with an option for some work with *terroirs* in Kenedougou as well.

The NGO project agreement will be signed with the Ministry of Plan where all NGO activity is followed through the BSONG. Funding can be handled through an Operations Program Grant (OPG). Funds come directly into a bank account at the province level, avoiding lengthy and cumbersome "trickle-down" through various ministries and levels.

Project headquarters will be at Bobo Dioulasso, capital of Houet Province, but also the regional node for Planning Region 9. The headquarters Staff will include:

- Burkinabe Project Director (best chosen from the political rather than bureaucratic level;
- Permanent (NGO staff) Project Manager;
- Administrator;
- Financial Manager;
- Technical Assistants for:
  - Agriculture;
  - Forestry;
  - Livestock and range management; and
  - Village organization and enterprises.

Regional headquarters will be responsible for management, administration, logistics, finances, evaluation, and some planning activities. In Bobo Dioulasso, project staff will liaise with the GOBF Regional Coordinating Committee and Director of the Regional Coordinating Unit (Min Plan). (In the absence of a Regional Coordinating Unit, High Commissioners of the concerned Provinces chair the coordinating body alternately. This is current practice for the Committees de Concertation.)

Project staff will cooperate closely with a Technical Steering Committee drawn from relevant members of the larger coordinating group. This is the locus for planning, and serves as platform for formation of working teams drawn from the ministerial technical services. These teams, composed of ministry personnel and project technicians, develop work plans in connection with Village Management Committees, and support implementation at the local level.

# Management Project for Burkina Faso

## ENABLING Agreements:

National Level:

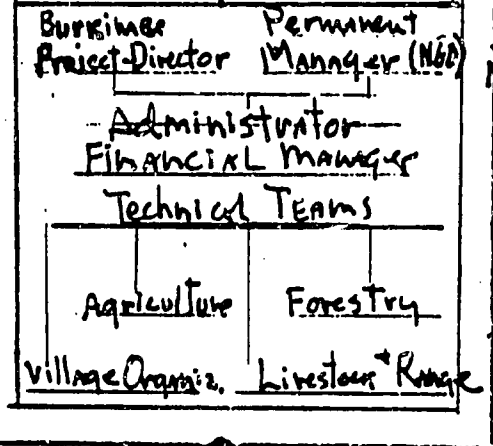
(USAID) + NGO project-agreement with Ministry of Plan and Cooperation

Funding: 1) USAID to NGO through OPG<sup>1</sup>  
 2) USAID to Ministry of Environment & Tourism through NPA<sup>2</sup>

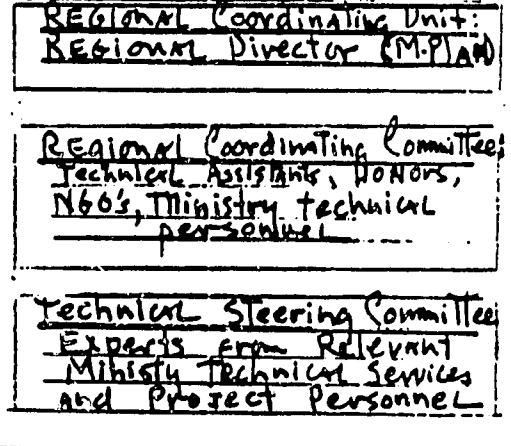
## PART 1. Project-Implementation-Structure:

Regional Level:

### NGO-Managed Project:



### Govt. of Burkina Faso:



Provincial Level:

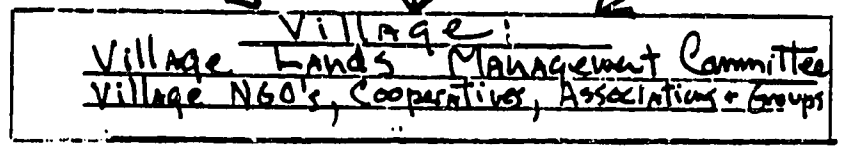
### Provincial Coordinating Unit - Multi-Disciplinary Team

Forestry Activities  
 Primarily with  
 Min. of Environ-  
 ment & Tourism

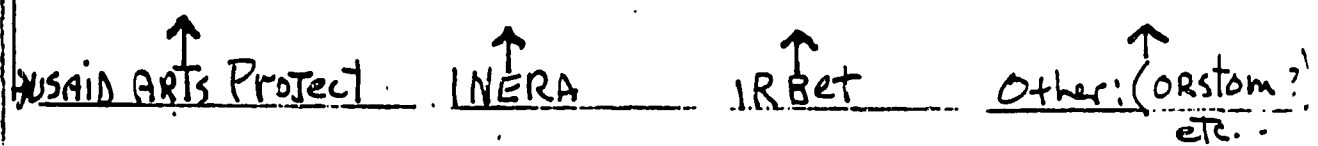
Village Organization  
 + Management Activities  
 Primarily with  
 Min. of Cooperation  
 Peasant Action

Agriculture, Range,  
 + Livestock Activities  
 Primarily with  
 Min. of Agriculture  
 + Livestock Husbandry

Village Level:



Support Resources



<sup>1</sup> OPG = operations program grant  
<sup>2</sup> NPA = Now project assistance + cash transfers for policy & institutional reforms



The project cooperates with and draws support from a variety of Burkinabe sources (i.e. INERA, Geographic Institute, University Faculty, ORSTOM), and exchanges information with other development activities and donors on a regular basis. In addition, the NGO maintains contact and coordination with SPONG and the NGO community.

## **NOTES AND RECOMMENDATIONS**

### **Response to the Big Problems**

The big, underlying social problems are land tenure, anarchic internal migration and settlement, and the lack of productive integration of transhumants and their animals. Accordingly, the Mission will have to be sure that these elements are recognized and specifically addressed in the final design of the NRM Project. The concepts proposed in this Paper suggest approaches to assist in land-tenure resolution, and integrative agricultural and animal-husbandry land use. It will be important for the Mission to closely follow institutional control measures proposed by GOBF to address migration and settlement in connection with and subsequent to the RAF reform. The AVV model was a first experience, but is now well behind the curve of increasing anarchic migration, settlement, and land-exploitation. Lack of control in this area can undercut all NRM sponsored conservation measures.

### **Recommendations for a Successful Project**

1. The NRM project, as described above, should locate management, administration, coordination, and evaluation activities at the regional level, and implementation and monitoring at local levels. Information flow is essential, and not always assured from level to level. The monitoring/evaluation/corrective feedback loop will be of vital importance to assure sensitive implementation. It should therefore be carefully designed into the project, and not left as matter of course.
2. Within the same close area, different villages may have very different ethnic composition, cultural methods, and development experience. Therefore, preproject or early-project-phase village surveys should be designed to screen, choose, and collect baseline data for villages in which the Project will work. We believe a standard survey instrument could be designed, but should be completed with a section of open ended commentary. It has been proposed that ORSTOM graduate students could accomplish some of this study. This could provide the Project with good skills at little cost, and in a timely manner. If deemed desirable, this should be coordinated with the ORSTOM Studies Director at Bobo Dioulasso, M. J.P. Hervouet.
3. Project designers should look for results of research produced by the Italians on pastoral systems and transhumants, and consult Delgado's 1979 paper on fulani mixed agriculture and stock-raising

systems.<sup>24</sup> With this base, it may still be judged necessary to plan some assessment research on current transhumant patterns and practices. Studies should concentrate on overall management strategies and how they are formulated, on where they are at what season and how corridors are chosen, and on patterns of interaction with settled farming people.

4. Project designers could usefully explore the institutional record and relationships in the PSB program when planning specific measures for institutional and donor coordination. Both positive and negative aspects should prove instructive.

5. PANE has posited a Regional Information and Documentation Center. The USAID NRM project might build on this theme an element of regularly repeating donor/project Workshops, which could be used to exchange ideas and information, and coordinate with other donors in the area.<sup>25</sup> Once institutionalized, this could provide a worthy mechanism for regular information flow.

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<sup>24</sup> Delgado, C.L. *Le système d'exploitation agricole des Peuls du sud de la haute volta: Une nouvelle forme d'un ancien modele d'intégration de l'élevage et de l'agriculture dans la savane de l'afrique occidentale*; Series: African Rural Economy Paper #20. Michigan State University Department of Agricultural Economics; E. Lansing.

<sup>25</sup> It is usually harder to recruit for meetings than for workshops, and conferences are too formal, important, and take time to prepare.

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J. Allen, Feb. 1990, Paper for World Bank, title unspecified; reference: Land tenure and the PNGTV in Burkina Faso, NRM Project Concept Paper.

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MET/Comite National de Lutte Contre la Desertification (CNLCD). 1989. Projet d'un Plan D'Action National pour l'Environnement (PANE). *Rapport Provisoire et Partiel*. Octobre.

MET/CNLCD. 1990. *Actes de l'Atelier sur le Plan d'Action National pour l'Environnement*. Bobo-Dioulasso, du 3 au 6 Octobre 1989.

MET/CNLCD. Rapport d'Activites du Secretariat Permanent du CNLCD: 1ere Trimestre 1990. Ouagadougou, juillet, 1990.

World Bank/MET/CNLCD/PANE Commissioned Working Papers (September/October 1990):

Zeba Souleyman, "Identification d'un Programme de Renforcement de la Protection des Especies Animales et Vegetales au Burkina Faso."

"Definition d'un Programme de Protection des Plans d'Eau des Berges et des Forets Ripicoles."

S.E.P.I.A. "Etude Demographique: Projections de la Population Burkinabe pour les Annees 1990, 1995 et 2000."

Min Environnement et Tourism; Programme Allemand CILSS; Proposition de Programme Sahel Burkinabe, Dec. 1986

**PROGRAMME DES VISITES**

3 OCTOBRE - 2 NOVEMBRE 1990

- Mercredi, 3/10** Arrivee a Ouagadougou, John Heermans et Bob Winterbottom
- Jeudi, 4/10** Prise de Contact - USAID
- 11 h. MET, Sec. Gen. Kambou et Dir. Foret et Faune, Zida Bertrand
- Meeting with Tom Painter, IDA/OCP consultant
- Vendredi, 5/10** Prise de Contact - SPONG (Zagre Bartelemly), Projet FAO/Amenagement Forestier, Delima Salomon et Soto-Flandes, et Mission Banque Mondiale (PANE) (F. Cardy et al.)
- 10 h. MAE, Sec. Gen. Jean Paul Sawadogo
- 15 h 30, PNGTV Coord., Arzouma Koussoube
- SameBdi, 6/10** Etude - documentation ESMAP, PNGTV, TFAP
- Dimanche, 7/10** Arrivee - Mike McGahuey
- Lundi, 8/10** MET, Direction Forets et Faune; Service d'Amenagement Forestier
- Lunch with Wilbur Thomas, Roger Simmons, Della McMillan
- Mardi, 9/10** 11 h. IGB, Dembele Ousmane
- 15 h. Comm. National Lutte contre la Desertification (CNLCD), Adama Sanogho
- 16 h. Plan d'Action Forestier Tropical (PAFT), Lingani Jean
- Mercredi, 10/10** Visite - Projet Pilot PNGTV/GTZ, Patecore Helmut Egger
- Jeudi, 11/10** 8 h. MET, ZIDA Bertrand
- 11 h. MAE, Nibie Boureima et Chef, DEP
- 16 h. AVV, Dir. Etudes, Millogo
- soir: Universite/IDR - Jacques Fontes
- Vendredi, 12/10** Visite - Projet UNSO, Amenagement Forestier, Koudougou/Reo, Peter Wright

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- Samedi, 13/10** Visite - Projet Pilot PNGTV/AVV, Mogtedo avec Yanogo Arthur Felix
- Dimanche, 14/10** Etude documentation: PANE, AVV/PNGTV projet pilotes
- Lundi, 15/10** 8 h. Della McMillan, PANE/AVV consultant  
12 h. Bill Fiebig, agronome, projet ARTS  
16 h. Banque Mondiale, Equipe PANE (Cardy, Halter, McMillan, Prevost, Tejeda, Buursink, Roland)
- Mardi, 16/10** 10 h. CILSS / CRT()  
11 h 30 - FED  
15 h. - USAID , mise au point
- Mercredi, 17/10** Visite - Region du Sud/Sud Ouest:  
10 h. Boni, visite champs SOFITEX  
12 h. Koumbia/ Foret de la Mou, Gnoumou Marius  
Soir: MET, Dir. Regional, Coulibaly Sambou  
et PNGTV/CRPA, Saidou Sanon
- Jeudi, 18/10** Survol de le region  
Visite - installations agricoles, environs de Hounde  
Discussions avec Pere M. Terrible; CESAO
- Vendredi, 19/10** PNGTV, Projet Nione Djonkele et Direction Provincial, Banfora et Dir. Regionale, Bobo-Dioulasso.
- Samedi, 20/10** Projet UP10/GTZ, Diebougou
- Dimanche, 21/10** Retour a Ouagadougou; etude de documentation
- Lundi, 22/10** Arrivee de l'Equipe DAI, Harvel Sebastian et Tony Johnson
- Mardi, 23/10** matin - mise au point - programme de mission  
16 h. Sec. d'Etat - Elevage, DRET

- Mercredi, 24/10** 9 h. Reunion USAID - mise au point
- Depart - Mike McGahuey; arrivee - Idrissa Samba, environmentalist, AID/REDSO/Abidjan
- 12 h. John Buursink, Equipe PANE
- 15 h. PNUD - Ouedraogo Sylvestre, coord. projets forestiers UNSO/PNUD/FAO
- Jeudi, 25/10** Ouverture - Table Ronde - PAFT  
Clark Lungren, Projet Nazinga
- Vendredi, 26/10** Cloture - Table Ronde - PAFT
- Samedi, 27/10** Preparation du compte rendu de mission
- Lundi, 29/10** 11 h. - Reunion de synthese - MET/ Sec. Gen.  
17 h. - Reunion de synthese - USAID  
Depart - John Heermans
- Mardi, 30/10** 7 h. Mission INSAH/UNSO - Besoins de Formation pour la Gestion des Res. Nat.
- 8 h 30 - OCP - Controle de l'onchocercose
- 10 h. CILSS - reunion de synthese
- 15 h. MET/GTZ - reunion de synthese et coordination avec le PAFT
- Mercredi, 31/10** 7 h. Sten Hagberg, Projet UNSO, Gestion des Ressources Naturelles - Comoe/Kenedougou
- 8 h. CCCE - Delacroix  
9 h. 30 : reunion de synthese MAE/DEP, DRET, et AVV  
11 h. Clark Lungren, ADEFA  
12 h. IGB - Dembele Ousmane  
15 h. CNLCD - Sec. Perm. Sanogo  
16 h. PNGTV - Dir. Koussoube  
17 h. SPONG - Sec. Exec. Zabre  
17 h. 30 CNRST - Bognounou
- Jeudi, 1/11** (Ferie) : mise au point du rapport
- Vendredi, 2/11** Depart - Bob Winterbottom
- Autres reunions a confirmer: DAT, Canada, INERA (ARTS)



[Harvel Sebastian arrived in Ouagadougou on October 22, 1990. The following is the schedule of visits throughout her period in-country:]

**Visit schedule: Wednesday, 24/10/90 through Friday, 9/11/90.**

**Wednesday, 24 October:**

1. 1000h. Debriefing Meeting with USAID Acting Director, ADO, FSN Boue, and Team Members: MMcGahuey, BWinterbottom, JHeermans, AJohnson, HSebastian.
2. 1600h. Ministry of Agriculture, Livestock Section: Secetaire d'Etat a l'Elevage, M. Amadou Maurice Guiao, plus 4 unnamed Aides. Note: Mr. Guiao is himself a Fulani (pastoralist).

**Thursday, 25 October:**

1. 1200h. Team lunch with Clark Lundgren, Nazinga Ranch Ex-Director. Briefing on wild-life management system and problems encountered.

**Friday, 26 October:**

Morning at TFAP Round-Table Conference.

**Weekend of 27, 28: Read-in and one-on-one discussions with Team Members.**

**Monday, 29 October:**

1. 1100h. Meeting at MET with Sec'y General M. Jean Baptiste Kamou. USAID ADO McCarthy, M.Boue, Winterbottom, Heermans, Samba, Sebastian.
3. 1430h. Meeting of Team with USAID Dir. Thomas, and Dep.Dir. Sharp.
4. 1530h. Team Status Meeting before departure of Heermans.

**Tuesday, 30 October:**

1. 0645h. Breakfast meeting with Univ. of Arizona Range Management Team (Club du Sahel auspices).
2. 0830h. HS meeting with Dr. DeSole, Epidemiologist at OCP.
3. 1000h. Team meeting at CILSS with Van Mourick, Steve Reid, Dir. of Ecology and Environment Service M. Goumandakoye.
4. 1445h. HS meeting with DCM Beecroft for contextual discussion.
5. 1600h. HS meeting with Ed Robbins, Sociologist on ARTS Team.

**Wednesday, 31 October:**

1. 0645h. Team breakfast with Sten Hagberg of UNSO/Swedish Comoe Natural Resources Mgmt. Project.
2. 0800h. HS brief meeting at Caisse Centrale with Perpignan and de la Croix.
3. 0900 Meeting with MAE, AVV, and DRET/Elevage: Dir. for Planning and Studies, M. Jean Baptiste Douamba, Agronomist, M. Gilbert Soubeiga, AVV, M. Andre Dabire.
4. 1130h. Meeting at PNGTV with McCarthy, Winterbottom and Sebastian.
5. 1200h. Lunch meeting with Clark Lundgren, Nazinga Ranch.

**Thursday, 1 November: Holiday.**

1. 1530h. Debriefing meeting with USAID Dir. Thomas before Winterbottom's departure.

**Friday, 2 November:**

1. 0900h. HS to CILSS for further discussions with Goumandakoye, Van Mourick, and Reid.
2. 1100h. Meeting in USAID Dir/Office with World Bank Team Cardey and Watson, re PANE.

**Saturday, 3 November: Read-in.****Sunday, 4 November: HS Travel to Bobodioulasso.****Monday, 5 November:**

1. 0800h. M. J.P. Hervouet, Geographer, and Director of Research at ORSTOM.
2. 1130h. M. Kambire, Ecologist at Centre Ecologique.
3. 1500h. Dir. CRPA for Houet, M. Sibiri Traore.
4. 1600h. CESA Documentalist M. Jean Ouandorah

**Tuesday, 6 November:**

1. 0830h. Fara Koba Research Station: Dir./Coordinator M. Oumar Badini. Also: M. Dieudonne Ilbudo, Sociologist.
2. 1000h. Haut Commissaire, M. Vincent Kabre-Tinga.

Return to Ouagadougou.

**Wednesday, 7 November:**

1. 0730h. CCCE, PNGTV Project Officer M. de la Croix.
2. 1000h. CIDA, Mrs. Suzanne Moreau.
3. 1100h. MACP, Sec'y General M. Jerome Thiombiauo.

**Thursday, 8 November:**

1. 0730h. M. Andre Roch Compaore, Nat' Coordinator for Donor Agencies; M. Sylvestre Ouadreogo, UNDP. Note: Both are quondam Ministers.
2. 0900h. AVV, M. Nebie Boureima.
3. 1130h. CNRST, M. Ouatien Bounounou, Ethnobotanist and Researcher.

**Friday, 9 November:**

1. 0900h. Dir. Amenagement du Territoire, M. Bassirou Ly.

## **LIST OF KEY CONTACTS**

(In addition to USAID staff and AID project technicians)

**Jean Paul Sawadogo, Secrétaire General, Ministry of Agriculture and Livestock. On top of issues re. AVV, PNGTV, agricultural and rural development, RAF.**

**Director, DEP, Ministry of Agriculture. Good perspective on agriculture and rural development issues; well informed about projects and studies implemented by MAE.**

**Gilbert Soubeiga, MAE/DEP. Member of NRMS action plan team. Long experience with agricultural development issues and project implementation and administration at the level of the CRPA. Knows the southwest region.**

**Boureima Nibie, AVV. Member of NRMS action plan team. Well informed about RAF, PNGTV pilot projects, AVV studies.**

**Arzouma Koussoube, Directeur, Cellule Nationale de Coordination, PNGTV, Ministry of Plan and Cooperation. Key source of information and insights re. PNGTV, RAF. Formerly with MAE/CRPA in the southwest. Knowledgeable re. agricultural development issues.**

**Jean Baptiste (?) Kambou, Secrétaire General, Ministry of Environment and Tourism. Long term perspective re. role of MET in forestry sector development issues. Formerly with UNDP and GTZ reforestation projects, MET provincial and regional director. Key player in defining MET role in PNGTV, PNLCD, RAF.**

**Alfred Zongo, Directeur, DEP, MET. Coordinates studies and project planning in forestry/ environment.**

**Djiri Dakar, Directeur General des Eaux et Forêts. Outspoken re. MET position re. TFAP, PNGTV, RAF, forest policy. . . Coordinates rural forestry, forest management, fisheries, wildlife and park management services.**

**Zida Bertrand, Directeur, Forêt et Faune, MET. Responsible for forest management, and park/ wildlife management services (essentially all of the classified or reserved forest land)**

**Jean Lingani, TFAP National Coordinator, MET. Responsible for managing preparation of Tropical Forestry Action for Burkina. Assisted by Rolf Krezdorn, GTZ/International Coordinator for TFAP/Burkina.**

**Albert Compaore and Adama Diallo, MET/Forest Management Service. Best sources of information re. natural forest management policies, techniques and experience, potentials in Burkina. Albert is also investigating land use/agriculture/forestry interactions (for PhD thesis).**

**Compaore Jean Abdias, MET/Forest Management Service. Member of NRMS action plan team. Involved with mapping of vegetative cover and population pressure in Burkina.**

**Edouard Bounkougou**, ICRAF regional office director, formerly with IRBET/CNRST. Specialist in agroforestry research, plant ecology.

**Ouetian Bognounou**, IRBET/CNRST. Ethnobotanist, with long experience and interest in economic botany, medicinal uses of plants, etc. Plugged into UNESCO/Man and the Biosphere work in Burkina (Mare aux Hippos, etc.)

**Manuel Soto Flandez**, Conseiller Technique Principal, FAO project BKF/85/011 (Nazinon Forest Management). Key source re. natural forest management planning and techniques, wood fuel supply and demand issues.

**Helmut Eger**, GTZ Advisor, PATECORE project, Kongoussi. Re. experience of PNGTV pilot project which pioneered farmer participation in zonage, soils mapping, soil conservation practices. Also developed model of "projet d'appui" relationship to all technical services in the region, with support coordinated by a "comite de concertation".

**Clark Lungren**, Association pour le Developpement de l'Elevage de la Faune Africaine. Principal architect and manager of the Nazinga game ranch project. Long time resident of Burkina, and author/coordinator of extensive studies and fieldwork in game ranching.

**Della McMillan**, consultant with World Bank, AVV, Institute for Development Anthropology. Extensive field experience in evaluating socio-economic and environmental aspects of development activities re. to AVV and PNGTV.

**Ouedraogo Bangre Sylvestre**, UNSO/UNDP forestry project coordinator. Formerly Minister of Environment and chief of Forest Service. Good source re. forestry/TFAP/PNLCD activities.

**Pere M. Terrible**, Leader of "Assistance Ecologique", Bobo-Dioulasso. Long term resident with good perspective on land use changes, natural resource issues in Burkina; prepared first map of vegetative cover of Burkina; author of numerous articles and special studies re. environmental changes, sustainable development issues in Burkina.

**Peter Wright**. Technical Advisor, UNSO/Forest Management Project, Koudougou/Reo. Long term resident. Plugged into forest management issues. Creative force behind successful OXFAM agroforestry project (diguettes - Yatenga).

**Mounkaila Gourmandakoye**, Dirk Van Mourik, Dami Vincent Traore, Steve Reid: CILSS secretariat. Good source re. documentation and issues in desertification control, forestry and development in Burkina (and the Sahel region). Involved in TFAP.

**Bartelemeu Zabre**, Secrétaire Executive, SPONG. Clearinghouse for information on NGOS. Have followed development of TFAP. Have computerized database on NGO activities. Formerly with Ministry of Agriculture (? or Plan); knows gov't services/people as well as NGOS.

**Adama Sanogo, Secetaire Permanent, Comite National de Lutte contre la Desertification.** Aims to coordinate activities of 11 ministries involved in the implementation of the national desertification control plan (PNLCD). Chief government contact for World Bank assisted environmental action plan, and for national coordination of Programme Sahel Burkinabe (see also donor-financed coordinator: Andre Roch Compaore, Mission Allemande CILSS).

**Dembele Ousmane, Ingenieur Cartographe, Institut Geographique du Burkina.** Responsible for World Bank financed mapping of vegetative cover of protected areas (forest and wildlife reserves); knowledgeable about resource inventories based on aerial photos and remote sensing.

**Andre Roch Compaore, Coordonnateur National: Programme Sahel Burkinabe (PSB).** One time Minister, highly knowledgeable, and a political power.

**Amadou Maurice Guiao, Secetaire d'Etat a l'Elevage,** is himself of Fulani background, thus understands problems of the pastoral sector.

**Franklin G. Cardy, World Bank Environmental Management Specialist, Infrastructure Division Africa Regional Office, Sahel Section., and Peter L. Watson, Chief Infrastructure Division, Africa Regional Office; PANE development team.**

**J.P. Hervouet, Director of Research, ORSTOM at Bobodioulasso.** A Geographer, and longtime in country and Sahel, can offer "deep background" on all the Southwest region. Would be prepared to cooperate in studies of specific areas, and preliminary assessments of villages in which project proposes to work.

**Sibiri Traore, Dir. of CRPA for Houet.**

**Dami Vincent Traore, Director of Programs at CILSS**

**Tinga Vincent Kabre, High Commissioner of Houet Province.**

**Bassirou Ly, Directeur, Amenagement du Territoire, Ministry of Plan.**

**L. James Alritz, CLUSA, African Regional Director.** Newly based in Ouagadougou, has received first briefing on the NRM project, and is prepared to consider CLUSA involvement at one or possibly more levels.

**Paul Kleene, CIRAD, French agro-economist working with French PNGTV program in Houet.** Somewhat apprehensive of USAID involvement in region where the French are already working. Would be useful for PID team to engage further conversation, and clarify donor relation and possible interaction.

**Karen Schwartz, at National Cooperative Business Association (CLUSA), 1401 N.Y. Avenue, tel. 638-6222; n.b. team has not talked with her, but this name is included for pre-field contact if possible, by PID team.**

**ANNEX ONE**  
**REDSO**  
**PID REQUIREMENTS**

## PROJECT DESIGN REQUIREMENTS

### I - DESIGN TEAM:

#### a) IQC team:

Not required.  
See NRM Action plan/Concept paper.

#### b) REDSO/WCA:

Project development officer	4 week
Environmental Officer/advisor	2 week
Education Advisor	2 week

#### c) USAID/Burkina:

Program Officer	2 week
Agricultural development Officer	2 week
Agricultural Economist	2 week
Controler	2 week
Management Officer	2 week

#### d) Government of Burkina Fasso:

Ministry of Environment and Tourism	2 week
Ministry of Plan and Cooperation	2 week
Ministry of Agriculture and Livestock	2 week

### II - LOGISTICAL SUPPORT:

International travel for REDSO/TDYERS will be the responsibility REDSO/WCA. USAID/Burkina will provide incountry transportation for A employees including those from REDSO. The mission will provide offic space to PID team as well as access to computers. Technicians from G will be provided temporary office space and in-country transportation required during the PID design.

### III - PD & S FUNDING:

For PP design.



IV - DESIGN SCHEDULE:

Action	Date	Action Agent
PID drafting	1/14 to 2/11	REDSO/WCA, PDO
PID/IEE preparation	1/21 to 2/7	REDSO/WCA, REA
Mission PID review	o/a 2/10	USAID Burkina
PID submission to AID/W	o/a 2/18	USAID Burkina
PID review/approval	o/a 3/4	AFR/PD, /SWA, /DP
PID guidance cable sent	o/a 3/11	AFR/PD/SWAP
PP Design begins	4/11	REDSO/WCA PDO
Technical analist	4/11	IQC
Initial draft completed	5/30	AID Burkina
Draft PP review completed	6/30	USAID/Burk., GOBF
Final PP version	7/30	REDSO/WCA PDO
Final internal review of PP	8/30	USAID Burkina
Project review/negotiation	9/15 to 31	AID/W
Project authorization	"	"
ProAg signed	"	"
Allotment of funds	"	"

Hornel

GENERAL BACKGROUND FOR  
THE DESIGN BURKINA NRMS PROJECT DOCUMENT.

**1.0 PROGRAM/PROJECT DESCRIPTION**

This project is designed to promote the integrated and sustainable management of natural resources in the south-west region of Burkina Faso. The welfare of the vast majority of the region's population is directly dependent on the productivity of the land and water resources that they exploit. Improved management and conservation of the productivity of agricultural, pastoral and wood lands are critical to economic development efforts in the area.

Please refer to above detailed project description.

**2.0 BACKGROUND ENVIRONMENTAL INFORMATION**

**2.1 Location:**

The project activities will be focussed on the provinces of Houet (Bobo Dioulasso) and the Comoe (Banfora), south-west region of Burkina Faso.

**2.2 Climate:**

The project area is located in the soudanean zone in the south-west: 9°30 and 11°30 north. In the area rainfall varies from 1200 mm to 1300 mm with a high erosion index. Mean temperature patterns are as follows: maxima: 30 to 33 C: March April May, minima: 13 to 14 C: December January. Annual sunny hours: 2600 at Bobo-Dioulasso. The fluctuations of the temperature regime combined with the drying effect of the Harmattan dramatically boost evaporation and evapotranspiration. The humidity balance is positive during 3 to 4 month and negative during 8 to 9 months. In the northern area of the country the humidity balance is negative year round: evaporation and evapotranspiration are not compensated by precipitations.

These climatic factors determine 4 major seasons with differences in length from north to south of the country:

- Dry and cool from November to March
- Dry and hot from March to June
- Wet from June to October
- Hot and fairly humid from October to November

The combination of the decrease in rainfall, "aridization", high sun incidence, high evapotranspiration and the Harmattan determine the different ecological zones of the country.

**2.3 Topography:**

The topography has the aspect of a peneplain with a mean altitude of 300 m cut by the Comoe and Mouhoun valleys, the cliffs of Banfora and the plateaux that emerge in the west.

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#### 2.4 Geology:

The entire country is located in the geological continental platform composed of granite and gneiss covered by three major secondary geomorphological formations:

- Precambrian metamorphic and eruptive that occupies about 3/4 of the country (schists, quartzites, green rocks),
- Several hundreds of meter deep sediment cover in the south-west, becoming sandy-clay towards the north,
- Thick gres and calcarus dolorite formations in the north.

#### 2.5 Soils:

Most of the soils were generated from old chemical processes. The natural fertility of soils is poor. Cultivation degrades the soils and contributes to erosion and washing processes. The pressure on soils of an increasing population does not allow fallow periods.

The Bobo project area is dominated by tropical ferruginous and hydromorphous soils, erosion generated eutrophic brown soils on gravelly formations, suitable for agriculture. Soils suitable for agriculture are about 91.7% of the total region.

The Gaoua area has two major soils formations dominated by ferruginous soils, with eutrophic brown soils. That later variety of brown soils dominates the country. The entire region has soils fertile enough for agriculture.

#### 2.6 Hydrology:

The country's water resources are estimated at about 10 billion cubic meters of surface waters and 9 to 10 billion cubic meters of groundwater. The major river basins of the country cover parts of the project area in the south-west: The Banifing (west), the Comoe (south-west), the Volta, Mouhoun, Nakambe, Nazinon (center). The tributaries of the upper Banifing create wide floodplains: Longo: 10,000 ha and Sankare, both under agriculture. The project area has some natural lakes linked with the different rivers. Artificial lakes have been built for the purpose of energy production, domestic, agriculture and livestock uses.

#### 2.7 Vegetation:

The southern soudanean zone with more than 1,000 mm of annual rainfall presents dense savanna areas and dense dry forests in the lower zones and in the floodplains. The rivers are bordered with gallery forests.

Crops include cereals and tubers and the yields are higher than that of the northern part of the country.

The drought effects on the areas can be observed thru the intense immigration of herders and farmers from the center and the northern part of the country. This impacts considerably the river banks and floodplains.

WV

Forests reserves of the project area:

Around Bobo-Dioulasso: Koulima

Poa

Dinderesso

Around Banfora:

Diefoula

Niangologo

Kaflande

Boulon

Toumousseni

Bounouma

Beregadougou

Poni

Gouandougou

Kongoko

Dida.

2.8 Fauna/ Wildlife:

Wildlife has suffered from the effect of traditional hunting, poaching as well as from the drought. Activities such as the Nazinga game ranching contribute considerably to the restoration of the fauna and their habitats in the region.

2.9 Fisheries:

Traditional fishing is practiced in the rivers and natural lakes. The creation of multiple small artificial lakes increases considerably fisheries activities.

2.10 Major Ecological Problems:

Burkina has a naturally fragile ecosystem: low and erratic rainfall, poor water infiltration, frequent and prolonged drought, high temperatures, hot and dry winds, and poor soils are common features. Average rainfall over the last 20 years has been declining. Rain is irregular and of high intensity particularly in the north, which causes loss through runoff and high erosion.

The soils resources are seriously depleted. Derived from rock types that characteristically yield soils of low productivity, the soils of the country tend to be stratum-overlying decomposed and infertile laterite rock. The scanty resource has been subjected to land use practices which have stripped the soils of fertility. Erosion rates are high and infiltration of water is low throughout most of the country. Slash and burn agricultural methods applied in the savanna tend to increase the propensity to erosion. The soil condition (structure and texture) also affects the recharge of groundwater systems and the quality of surface water.

In the past, when population was smaller, shifting agriculture, extensive grazing and nomadism helped farmers and herders overcome nature's shortfalls and enabled vegetation, soils and water resources to recover. Except for the north, where crop cultivation was marginal and livestock dominant, the traditional production systems throughout most of Burkina Faso were extensive and agro-sylvo-pastoral fallow systems widely spread. Today however these systems cannot keep pace with rapid population growth and the resulting need for more food. Because of land shortages, the decrease in

This in turn lowers land productivity and more pressure is then exerted on the remaining cultivable land. The expansion of cultivable areas, done by clearing new land in the still forested southern zone recently freed from river blindness, is often taking place in a wasteful manner, with many new migrants. Their ill-adapted production systems are causing major damages to a rich but fragile ecosystem and is now being felt in productivity declines. The "mining" of resources steadily reduces the chances of securing sustainable production for present and future populations in Burkina.

Increased demand for fuel wood and building materials exerted pressures on forests that far exceeded their reproductive capacity. The deficit between demand and annual incremental growth is expected to reach 2.2 million m<sup>3</sup> in 1995. Pressure of fuelwood demand force population to burn crop residues instead of re-incorporating them in the soil to maintain fertility. Few of the thirty provinces of the country provinces have a positive fuel balance.

#### 2.11 Human Population:

The last population census was in 1985. The population of Burkina Faso can be characterized as a young population. Most of the population, 85%, are farmers.

The population distribution in 1985 is as follows in the south-west:

REGION	TOTAL	% MALE	% FEMALE	%FEMALE 15-49	% 0-14	% 15-64	%over 64	% BORN	% DEAD	POP./ Km2
Bobo	997,662	49.7	50.3	21.6	47.8	49.2	3.0	48.8	15.0	22.4
Gaoua	456,375	48.1	51.9	22.8	48.1	48.7	3.3	46.5	15.5	26.2

Most of the Bobo area is occupied by ancien settlements of Bobo, Bwa, Senoufo, Tussian, all speaking Dioula. The south is mainly dominated by the Lobi. The Gaoua region is dominated by population from the left bank of the river Mouhoun, mainly Lobi.

The population education profile is as follows:

REGION	PRIMARY SCHOOL IN %	SECONDARY SCHOOL IN %	LITERACY TRAINING %
Gaoua region			
Bougouriba	22.7	2.54	8.8
Poni	20.0	2.26	7.1
Bobo region			
Comoe	23.3	5.28	13.7
Houet	35.3	13.25	27

Health assistance profile:

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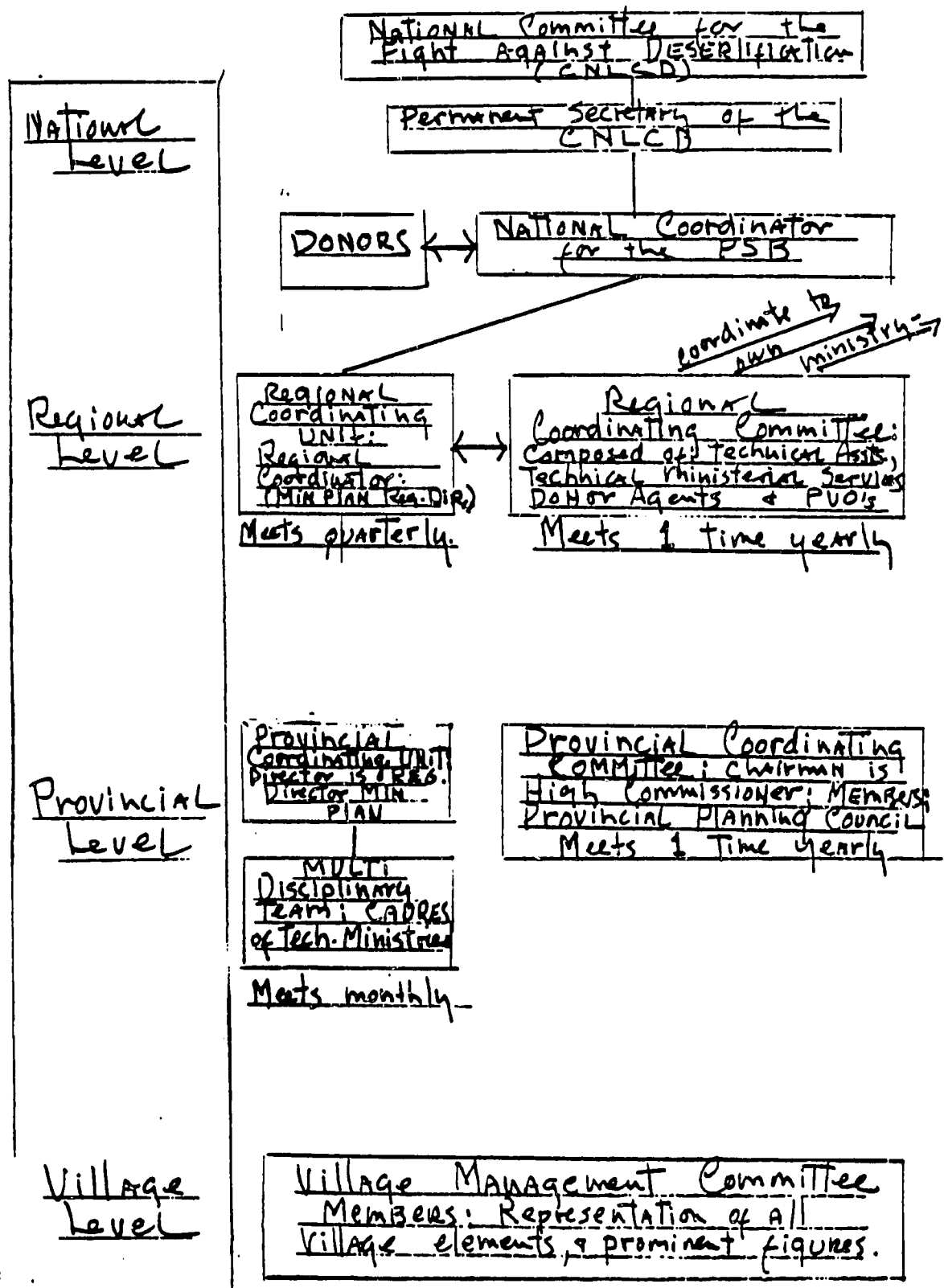
## 2.12 Agriculture:

Agriculture is traditional in Burkina. It is characterized by small sized family exploitations and producing mainly subsistence staple food (cereals).

In the Bobo area sorghum is the major crop followed by millet, corn, sesame, tobacco, rice, peanuts and cotton. Two irrigated areas: Kou and Farakoba. Two provinces with annual cereal production of over 80,000 metric tons per year, and the third province with cereal production fluctating between 20,00 and 40,000 metric tons per year.

The Gaoua region is dominated by sorghum/millet with yam in the south and peanuts in the north. Two provinces with cereal annual production fluctuating between 40,000 and 60,000 metric tons per year.

Table # TABLE of Organization  
(PSB) BURKINA Sahel Program



NOTES:

All projects under execution are under the oversight of the Regional Coordinator.

Regional Coordinating Committee: has program responsibility & approves reports. Regional Coordinator coordinates all projects; call quarterly meetings, prepares annual programs and reports to CNLCB, manages/audits finances.

Provincial Coordinating Unit: coordinates with all services; develops and implements yearly programs; determines specific activities. Provincial Director manages finances for the province.

Provincial Coordinating Committee: approves program status report, resolves problems, facilitates and has oversight of policy conformance.

Village Committee: is in charge of activities at the village level.

Budget Estimates are annual.

## LA STRUCTURE DU PSB ET SES FONCTIONS

Elle assure trois fonctions.

La fonction centrale de coordination incluant celle de supervision (suivi-évaluation) :

- La Coordination Nationale est assurée par le Comité National de Lutte contre la Désertification.
- La Coordination Régionale est assurée par le Comité Régional de Coordination présidé alternativement par les Hauts-Commissaires.
- La Coordination Provinciale est assurée par le Comité Provincial présidé par le Haut-Commissaire.
- Pour alléger la structure, la coordination départementale a été supprimée.
- La coordination villageoise est assurée par le Comité Villageois de Gestion du Terroir.

La fonction d'exécution incluant celle de supervision est assurée :

- au niveau national par chaque département ministériel qui a la tutelle technique des projets sectoriels relevant de sa compétence ;
- au niveau régional par le Directeur Régional du Plan et de la Coopération ;
- au niveau provincial par un directeur provincial du PSB (Directeur Provincial du Plan et de la Coopération) et par les services provinciaux techniques ;
- au niveau villageois par le Comité Villageois de Gestion du Terroir et par les Comités de Gestion des Actions Spécifiques Sectorielles :
  - . Comité de l'eau
  - . Comité maraîcher
  - . Comité Villageois de Santé
  - . Comité de Gestion des moulins à mil
  - . Comité d'élevage
  - . etc...

La fonction de concertation

- au niveau national : entre le CNLCD et les représentants des bailleurs de fonds présents à Ouaga ;
- au niveau régional : entre la Cellule Régionale de Coordination et les représentants régionaux des bailleurs de fonds (chefs de projets, etc...)
- au niveau provincial : entre le Comité Provincial de coordination et la Cellule de Coordination d'une part et, d'autre part, les représentants locaux des bailleurs de fonds.



STRATÉGIE DU P  
: =====

Niveau national : Comité National de Lutte contre la Désertification (CNLCD)

- **Président** : Le Ministre de l'Environnement et du Tourisme
- **Vice-président** : Le Ministre de l'Agriculture et de l'Elevage
- **Membres** :
  - . Ministère de l'Environnement : 2 membres,
  - . Ministère de l'Agriculture et de l'Elevage : 2 membres
  - . SGN/CDR : un représentant,
  - . Ministère de l'Eau : un représentant,
  - . Ministère de l'Enseignement Supérieur et de la Recherche Scientifique : un représentant,
  - . Ministère de l'Information : un représentant,
  - . Ministère des Transports et des Communications : un représentant,
  - . Ministère de l'Equipement : un représentant,
  - . Ministère de la Planification et du Développement Populaire : un représentant,
  - . Le Bureau de Suivi des ONG : un représentant,
  - . Ministère de l'Essor Familial et de la Solidarité Nationale : un représentant,
  - . Ministère de l'Administration Territoriale et de la Sécurité : un représentant,
  - . Ministère de la Question Paysanne : un représentant.

Niveau provincial

A) Directeur Provincial du PSB : Directeur Provincial du Plan et C.

B) Comité Provincial de Coordination

1° Province du SENO : (Cellule Provinciale de Suivi et d'Exécution du Plan Quinquennal)

- **Président** : Haut Commissaire de la Province
- **Vice-Président** : Directrice de l'Essor Familial

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- Appporteur : DRDPD
- Membres :
  - . Préfets
  - . Secrétaire Général du P.R.P.
  - . Les Représentants des ONG et Projets
  - . Le Représentant des opérateurs économiques
  - . Directeur de l'ORD
  - . " l'Elevage
  - . " l'Environnement et du Tourisme
  - . " l'ONPF
  - . " Désenclavement Terrestre
  - . " la Santé
  - . Le Représentant de l'Education Nationale
  - . " du Budget

Cette structure dispose en outre d'un Secrétariat Permanent composé comme suit :

- Secrétaire Général du PRP
- Secteur ORD Dori
- Comptabilité Haut Commissariat.

2° Province du SOUM : (Cellule Provinciale de Suivi et d'Exécution du Plan Quinquennal)

- Président : Haut Commissaire du SOUM
- Membres :
  - . Secrétaire Général de la Province
  - . Délégués des structures populaires
  - . Inspection 1er degré
  - . Santé
  - . Elevage
  - . Environnement et Tourisme
  - . Sports
  - . Secteur ORD Djibo
  - . Question Paysanne
  - . Essor Familial
  - . DRPDP
  - . ONG.

3° Province de l'OUDALAN

- Président : Haut Commissaire de l'OUDALAN
- Membres :
  - . Préfets
  - . Délégués Départementaux
  - . Représentants de l'UNAB
  - . Représentante de l'UFB
  - . Coordonnateur du Mouvement Pionnier
  - . Délégué des CDR de service
  - . Directeurs et Chefs de Services Provinciaux
  - . DRPDP
  - . ONG.

Niveau Régional :

A. Comité Régional de Coordination (Siège Dori)

- Président : Haut Commissaire
- Membres : (Membres de la Cellule Régionale de Suivi et d'Exécution du Plan Quinquennal)

B. Cellule Régionale de Coordination (Siège Dori)

- Président : Directeur Régional de la Direction Régionale de la Planification et de Développement Populaire (DRPDP) :  
Coordonnateur Régional du PSB.
- Membres :
  - . Le Directeur de l'ORD
  - . Le Directeur Régional de l'Eau
  - . L'expert Régional en Aménagement du Territoire et son homologue
  - . L'Expert Régional d'Elevage et son homologue
  - . L'Expert Régional Forestier et son homologue
  - . Le(s) chef(s) de projet(s) régional(aux) et son (leurs) homologues(s)
  - . Le chef du Bureau de Coordination Administrative et Financière.
  - . Le Directeur du Centre de Recherche de Katchari.

**ANNEX TWO**  
**INFORMATION ON BURKINA FASO**

**Organigramme du Ministère de l'Agriculture et de l'Élevage**

**Survey of Voltaic Ethnic Groups**

**NGOs in Burkina Faso, 1988**

**Demography**

**Health Infrastructure Data**

**Schooling and Literacy Data**

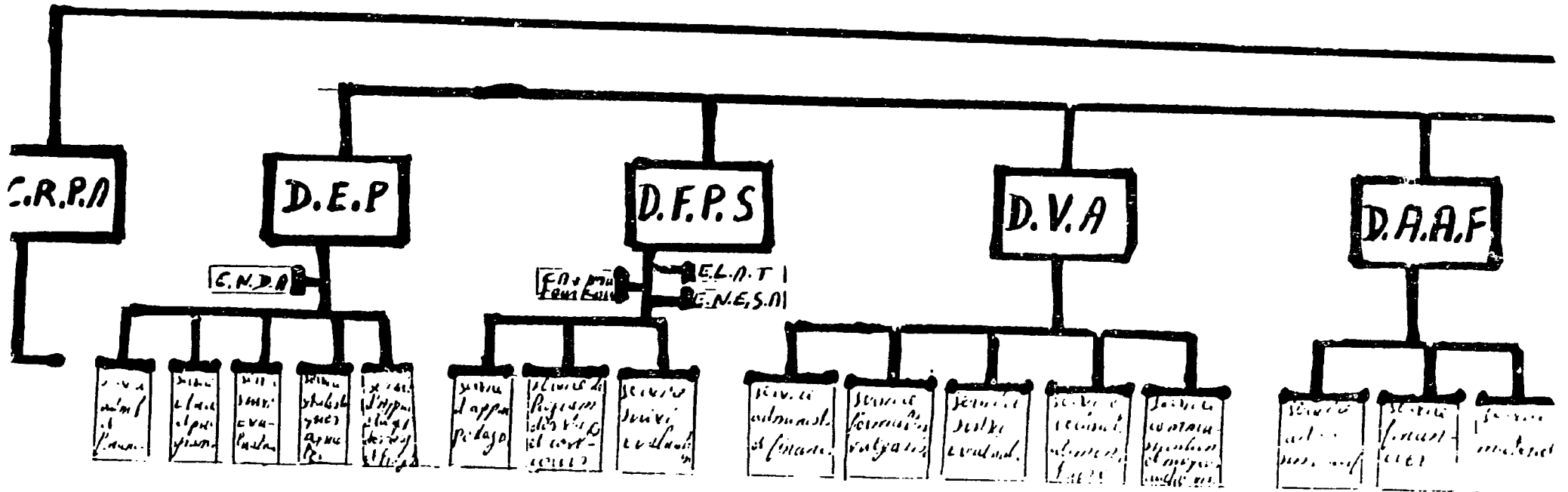
**Climatic Zones**

# ORGANIGRAMME DU MINISTERE D

cf: Kiti au V/01231FP/AGRI-EL

Portant organisation du ministere  
de l'Agriculture et de l'Elevage  
Conseil des ministres du 08-05-1982

Organigram of  
the Ministry of  
Agriculture  
and LIVESTOCK



## Survey of Voltaic Ethnic Groups\*

The peoples of Upper Volta offer a rich and complex array of ethnic groups. Indeed it is difficult to establish a definitive listing of Voltaic ethnic groups, as available sources differ in the degree of detail they offer and in the classification into major units versus subgroups which is used. This discussion draws on Balima 1969, Courel and Pool 1975, Finnegan 1978, Gingess 1978, Guiguemde 1975, Holmes 1978, IFDC 1977 V. 4, McFarland 1978, Murdock 1959, Skinner 1964, Tauxier 1912, and Urvoy 1942.

The most detailed list of ethnic groups in Upper Volta is given by McFarland in his Historical Dictionary of Upper Volta (1978:xvii-xviii), reproduced as Table 8 below. This includes some 56 named groups under 7 major headings (Mossi, Senufo, Lobi, Ninisi, Habe Bobo groups, Mande, and Gourounsi), and an additional 7 groups under the heading "other," for 63 groups in all. In 1964 Elliott Skinner included nine groups in his map of Voltaic ethnic groups, reproduced here as Figure 11 (Skinner 1964:frontice-piece). These are the Mossi, Gourma, Busansi, Gurunsi, Lobi, Senufo, Bobo, Samo, and Fulani. McFarland offers another map (Figure 12 below) which includes Mossi, Gurma, Fulani, Lobi, Senufo, Bobo, and such border groups as Tuareg, Songhai, and Zerma as well as some subgroups of these major headings (McFarland 1978:xvi). Virtually every one of the authors cited above classifies Upper Volta's peoples slightly differently.

Nevertheless there is some agreement on major categories. Most of the peoples of Upper Volta may be included in one of two groups, the Voltaic grouping and the Mande grouping, which together account for the majority of the population. This division is utilized by Murdock in his summary Africa: Its Peoples and Their Culture History (1959) and adopted by many other authors.

\*M. O. SAUNDERS, PURDUE UNIVERSITY, April 1980.  
1. unpubl. d. paper

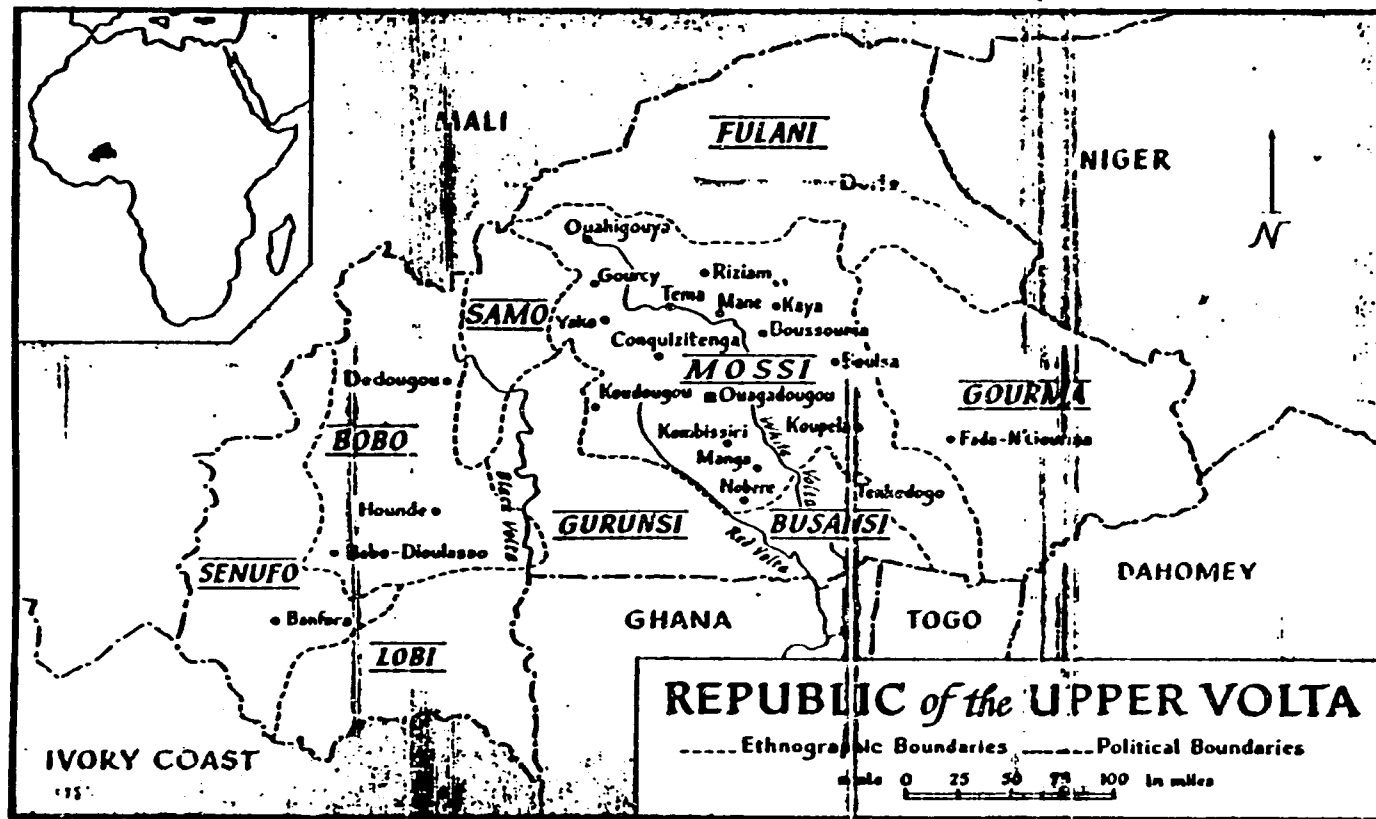
Table 8. LIST OF MAJOR ETHNIC GROUPS

<u>MOSSI</u> (Mole, Moshi)	<u>HABE</u>
Birifor	Bobo (Bwa)
Gourma (Gourmantché)	Bobo Fing (Black Bobo)
Gurensi	Bobo Gbè (White Bobo)
Konkomba	Bobo Oulé (Red Bobo)
Kusasi	Deforo
Nankana	Nienige
Ouagadougou	
Tallensi	
<del>Tenkodogo</del>	<u>MANDE</u>
<del>Wila (Wala)</del>	
<del>Yatenga</del>	<u>Bororo</u>
Zandoma	Busensi (Bissa)
	Dafing (Marka)
	Dioula
<u>SENUFO</u>	Marka
Gouin (Guin)	Samo
Karaboro	Samogho
Komono	Sia (Sya)
Minianka	
Nafana	<u>GOUROUNSI</u>
Nanerge	Awuma
Turka (Tourka)	Builsa
Tyéfo (Tiéfo)	Dagari
Wara	Frafra
	Isala
<u>LOBI</u>	Kasena
Dorosie (Dokhosie)	Nounouma (Nunuma)
Dyan (Dian)	Sissala
Gan	Vagala
Kulango	
Tusyan	
Vigye	
<u>NINISI</u> (Tinguimbissi)	<u>OTHERS</u>
Fulse (Foulse)	Fulani (Fulbe, Peul)
Kibsi	Liptako
Kipirsi	Silma Mossi
Kurumba (Akurumba)	Songhai
Lilse	Tuareg
Nioniosse	Yarsé
	Zerma (Zaberma)

(McFarland 1978:xvii-xviii)

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: Figure 7. Ethnic Groups of Upper Volta- Map 1

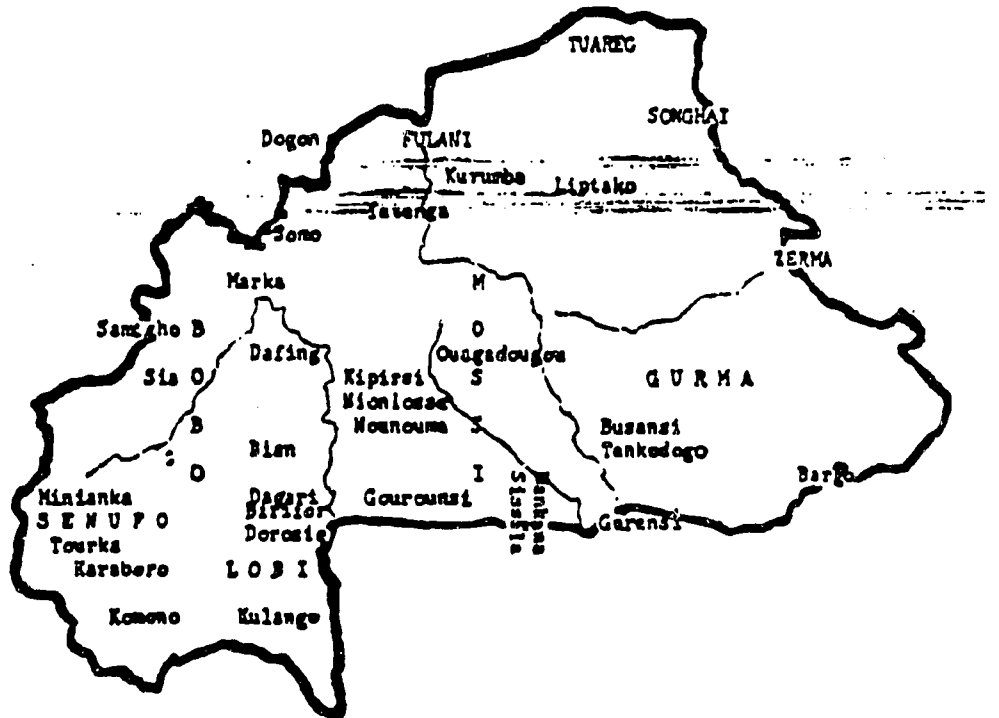


(Skinner 1964: frontpiece)

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Figure 8. Ethnic Groups of Upper Volta - Map 2.



Map 4. Ethnic Groups

(McFarland 1978:xvi)

Even authors who adopt the Voltaic/Manding breakdown as their starting point group the subunits in different ways and also arrive at divergent population estimates. The latter may at times be accounted for, the former, of course. For example, Balima (1969) and Guiguemde (1975), both presumably using the 1960 census as their starting point for population estimates, differ in ways which cannot be attributed to the difference in dates of publication:

Group	Balima's pop. est. (1969:15)	Guiguemde's pop. est. (1975:1019)
A. Voltaic Grouping		
1. Mossi & related peoples (Gourmantche & Yarse)	2,500,000	3,700,000
2. Gourounsi	300,000	310,000
3. Bobo	300,000	300,000
4. Lobi	100,000	130,000
5. Dagari*	60,000	not listed
6. Birifor*	60,000	not listed

\*As Table 8 indicates, McFarland classes Dagari as a subgroup of Gourounsi (Gurunsi) and Birifor as a subgroup of Mossi (1978:xvii).

#### B. Mande Grouping+

1. Boussansi	100,000	50,000
2. Samo	100,000	100,000
3. Marka	80,000	80,000
4. Dioula	20,000	30,000
5. Senufo	120,000	50,000

+McFarland groups Busansi (Bissa), Samo, Marka, and Dioula (as well as other groups) under the heading of Mande, and treats Senufo as a major heading in itself (Ibid.:xvii; see Table 8 above).

#### C. Other

1. Fulani	not listed	300,000
2. Bella	not listed	250,000

Working from the 1960 census, Courel and Pool (1975:738) offer figures on the percentage distribution of the population by major ethnic groups rather than actual population figures. Their calculations unfortunately excluded the two largest cities, Ouagadougou and Bobo-Dioulasso. They listed the following:

I. Mossi (& related)	48.0 %
II. Bissa [Busansi]	4.7 %
III. Gourmantche	4.5 %
IV. Bobo	6.7 %
V. Mande (e.g., Marka)	6.9 %
VI. Gourounsi	5.3 %
VII. Senufo	5.5 %
VIII. Lobi, Dagari	7.0 %
IX. Fulani (Peul)	10.4 %
X. Others	1.0 %

By 1977, the International Fertilizer Development Center adopted the following percentage distribution estimates:

1. Mossi	50 %	
2. Gourma	5 %	
3. Gurunsi	6 %	
4. Lobi	5 %	
5. Busansi [Bissa]	5 %	
6. Senufo	7 %	
7. Western Mande	16 %	(IFDC 1977)
8. Fulani	5 %	

As the maps in Figures 7 and 8 indicate, some clustering of ethnic groups by region does occur. Following Skinner's map, the predominate ethnic group or groups in each ORD (Regional Development Organization) are as follows:

## Central Region:

Ouagadougou	Mossi
Yatanga	Mossi
Kaya	Mossi
Koudougou	Gurunsi
Koupela	Busansi /Bissa/

## Eastern Region:

Sahel	Fulani
Fada N'Gourma	Gourma /Gourmantche/

## Western Region:

Bobo-Dioulasso	Bobo and Senufo
Dedougou	Samo
Diebougou	Lobi
Banfora	Lobi and Senufo

Even when one group is numerically dominant within an ORD, ~~however,~~ other groups are always present in smaller numbers. For example in the case of Kaya ORD, Fulani, Bissa, and Mossi may all be found either within a single village or in separate settlements within a few kilometers of each other (for examples of such mixture see McMillan 1979, Saul 1979, and Delgado 1979).

The reader should by now be adequately forewarned against any casual decision to select a sample stratified by ethnic group for research in Upper Volta. With the diversity of categories presently in use, it becomes particularly difficult to do any reliable weightings by ethnic group (given the difficulty in determining which subgroups are included in each category in published population figures and percentage distributions). Perhaps some of these problems have been resolved in the yet-unpublished 1975 census of Upper Volta.

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NGCS  
in BF

1988

ANNEXE No Liste des ONG ayant opéré ou opérant au Burkina Faso

Désignation de l'ONG	Date au B.F.	Nationalité	Zone d'intervention
Entraide Féminine	1959	Burkinabe	Kadiogo, Ouhritenga.
Entité Africaine	1959	"	Kadiogo
Catholic Relief Services (CAREVEL)	1960	Américaine	Dans toutes les provinces
Caritas Burkinabe	1961	Burkinabe	Dans toutes les provinces
Centre International de Développement Rural (CIDR)	1962	Française	Sissili, Oudalan, Houet
Organisation Sociale des Volontaires (OSV)	1963	Burkinabe	Dans toutes les provinces
Institut Panafricain pour le Développement de la région Afrique de l'Ouest-Sabell (IPD-AOS/SAHEL)	1964	Camérounais	Dans toutes les provinces avec un accent particulier au Yatenga
Centre d'Aide au Développement dans la Liberté et le Progrès (DELIPRO)	1967	Belge	Kadiogo, Sanmatenga, Bazega, Nahouri
Organisme contre la Faim et pour le Développement des Peuples (Hani Year 76)	1967	Italienne	Ouhritenga, Boukienzi, Boulgou, Sanmatenga
Association Néerlandaise d'assistance au Développement	1968	Hollandaise	Dans toutes les provinces
Association pour le Dévelop- pement de la Région de Foun (ADP-FON)	1968	Burkinabe	Sourou
Oxford Famine Relief Fund (OXFAM)	1968	Britannique	Toutes les provinces sauf Foni, Houet, Kéné Dougou, Comoe, Bougouriba, Kossi
Unifem des volontaires des Groupements Ruraux (UNIFEM)	1968	Burkinabe	Yatenga, Ouhritenga, Baz. Fessoulé, Sourou
Union Fraternelle des Croyants de Dori (UFC-Dori)	1969	Burkinabe	Séno

Mission Baptiste	1971	Américaine	Kadiogo, Escot, Gourza, Bulkiendé, Souron
Frères de Ecoles	1971	Française	Gourza, Boulgou
Mission Adventiste de Bazega	1971	Américaine	Bazega
Association pour la Promotion de la Médecine Préventive (APEP)	1972	Française	Bar, Sannatenga, Nazatenga, Yatenga, Eouet
Association pour le Développement de la Région de Kaya (ADPK)	1972	Burkinabe	Sannatenga, Nazatenga, Passoré
Fédération des Eglises et Missions Evangéliques (FEME)	1972	Burkinabe	Dans toutes les provinces
Union Fraternelle des Croyants de Goron-Goron (UFC-Goron)	1972	Burkinabe	Oudalan
Association Internationale des Volontaires Laics (AIVIA)	1973	Italienne	Ouhritenga
Fondation Nationale pour le Développement et la Solidarité (FONADES)	1973	Burkinabe	Dans toutes les provinces
Association Française des Volontaires du Progrès (AFVP)	1973	Française	Yapou, Kouritenga, Bar, Yatenga, Souron, Sanguié, Bulkiendé, Kadiogo, Bazega, Bougouriba
Comité de Développement de la Région de Yako (CDRY)	1973	Burkinabe	Passoré
Protection Britannique des Enfants Save the Children Fund (B.C.F.)	1973	Britannique	Séno, Oudalan
Sahel Solidarité	1973	Burkinabe	Toutes les provinces
Bureau d'Etudes et de Liaison (BEL)	1973	Burkinabe	Kadiogo, Kouritenga, Gourza, Bougouriba, Houet, Sannatenga
Coordonnateur National des Actions du Conseil Helmut Troitzsch	1973	Allemande	Dans toutes les provinces
Association des Veuves et Orphelins (AVO-B)	1973	Burkinabe	Kadiogo, Souron, Poni

Commission d'entraide et de Service des Eglises d'assistance aux réfugiés du Conseil Océanien des Eglises (COE)	1974	Suisse	Yatenga, Baz, Poni, Bougouril, Passoré, Sourou, Sizili, Oubritenga, Sanguié, Mombou, Zoundveogo
United Nations Association International Service (UNAIS)	1974	Britannique	Bolkiendé, Passoré, Séno, Yatenga, Sankatenga
AFPICAPE	1973	Américaine	Yatenga, Baz, Poni, Bougouril, Passoré, Sourou, Sizili, Oubritenga, Sanguié, Mombou, Zoundveogo
Service des Volontaires Allemands (SVA)	1975	Allemande	Foni, Bougourila, Mombou, S Kossi, Yatenga, Sour, Séno, Oudalan, Indigo
INDES-Forsation Institut Africain pour le Développement Economique et Social	1975	Internationale	Dans toutes les provinces
Plan de Parrainage International (PPI)	1975	Américaine	Baz, Kouritenga, Sankatenga, Sankatenga
Assemblée Spirituelle Nationale des SAKA'IS	1975	Burkinabe	Sanguié
Association Française des Fondations Raoul Follereau (AFFRF)	1975	Française	Dans toutes les provinces
Association Jeunesse d'Action pour la Coopération et la Solidarité (AJACS)	1975	Française	Kouritenga
Comité d'Animation et de Soutien à l'Action Sociale (CASAS)	1975	Burkinabe	
Euro-Action-Accord (EAA)	1976	Britannique	Oudalan, Sour, Sankatenga, Baz, Ganzourgon, Boulgon, Nanentenga
SOS-Sahel International	1976	Sénégalaise	Yatenga, Baz, Sour, Oubrite
Save the Children Federation (Fond de Développement Communautaire) (FDC)	1976	Américaine	Séno, Indigo, Basaga

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: Caïca des Comité pour le Développement des Peuples	: 1976	: Française	: Ouhritenga, Sizicili, Passoré, Zoundseogo, Houhou, Bougouriba
: Groupement des Artisans Ruraux du Yatenga (GARF)	: 1976	: Burkinabe	: Yatenga, Zoundseogo, Passoré, Sour, Oudalan
: Association pour le Développement Economique et Social de la Province de la Sizicili (ADESSI)	: 1976	: Burkinabe	: Sizicili
: Agence Adventiste d'Aide au Développement	: 1976	: Américaine	: Dans toutes les provinces
: Association pour le Développement Rural du Yatenga (ADRY)	: 1977	: Burkinabe	: Boulgou
: Association pour la Réhabilitation des Handicapés Burkinabe (ARH-BF)	: 1976	: Burkinabe	: Kadiogo, Kouritenga, Boulgou, Boukhiendé, Houet, Conoé, Houhou, Kossi, Sourou, Bougouriba
: Action Micro-Barrages (AMB)	: 1977	: Belge	: Boukhiende, Sanguié
: Association pour la productivité (APP)	: 1977	: Américaine	: Gourza, Gnagna, Yapon
: Association Internationale "IS"	: 1977	: Suisse	: Yatenga, Ban, Passoré, Ouhritenga, Sourou, Sour, Bougouriba, Conoé, Houhou, Gourza, Sanguié
: Association de l'Arche Kongr-Basson	: 1977	: Française	: Kadiogo
: Secours Populaire Français	: 1978	: Française	: Dans toutes les provinces
: Centre d'Etude et d'Expérimentation Economique et Sociale pour l'Afrique de l'Ouest (CESAO)	: 1978	: Suisse	: Dans toutes les provinces
: Comité Français pour la Campagne Contre la Faim (CYCF)	: 1978	: Française	: Kouritenga, Boulgou, Gourza, Yapon, Gnagna, Yatenga, Ban, Bougouriba, Houhou
: Promotion du Développement Industriel, Artisanal et Agricole (PRODIA)	: 1978	: Burkinabe	: Dans toutes les provinces
: Association Burkinabe pour le Bien-Etre Familial (ABBEF)	: 1975	: Burkinabe	: Kadiogo, Houet, Conoé, Kouritenga, Ban, Passoré

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: Association Burkinabe pour la : Protection des Aveugles et Mal- : voyants (LEPAM)	: 1979	: Burkinabe	: Dans toutes les provinces
: Mouvement aide a toute Betresse : Quart-Monde (ATD-Quart Monde)	: 1980	: Francaise	: Ladiogo
: Action Internationale Contre : la Paix (AICP)	: 1980	: Francaise	: Comodé, Yatenga, Kénédougou, : Gagna, Ouhritenga, Boulgou, : Zoundweogo, Moutoua
: Association pour le Développement : Naturel d'une Architecture et : d'un Urbanisme Africain (ADANA)	: 1980	: Suisse	: Dans toutes les Provinces
: Association le Point "Bulhouse"	: 1980	: Francaise	: Ouhalan, Ladiogo
: Centre Canadien d'Etudes et de : Cooperation Internationale (CECI)	: 1980	: Canadienne	: Bougouriba, Kouet, Ganzourgou : Passoré, Sour, Baz, Yatenga
: SOS-Sahel Burkina	: 1980	: Burkinabe	: Ladiogo, Bazega, Boulgou, Moutoua : Poni
: Société Coopérative : "IL SENTIERO"	: 1980	: Italienne	: Ouhritenga
: Association Canadienne : d'Aide à l'Enfance (ACDE)	: 1981	: Canadienne	: Nahouri, Comodé
: Les Amis de la Faculté de : Droit de Ouagadougou	: 1981	: Burkinabe	: Ladiogo
: Enfant du Monde	: 1981	: Francaise	: Ladiogo, Bulkiendé, Kouritenga : Kouet
: World Relief International : (Secours Mondial)	: 1981	: Américaine	: Yatenga, Passoré, Sankatenga, : Baz, Bulkiendé, Sissili, Ladiogo : Moutoua, Nahouri, Zoundweogo, : Ouhritenga, Sourou, Kénédougou
: Association des Volontaires pour : le Développement Autopromotion : et Solidarité	: 1982	: Burkinabe	: Baz, Bougouriba, Bulkiendé, : Sissili, Ouhritenga
: SOS-Sahel International B.P.	: 1982	: Burkinabe	: Yatenga, Baz, Ouhritenga, : Nahouri, Bazega, Ladiogo, : Sour, Passoré
: Christoffel Blinden Mission	: 1982	: Allemande	: Boulgou

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Titre de Paix de Taioro	1982	Belge	Faantenga
Cellule d'appui aux initiatives Villageoises	1983	Suisse	Bulkiené, Sizilli, Fabori, Radiogo, Oubritenga
Centre Ecologique Albert Schweitzer (CEAS)	1983	Suisse	Gourra, Radiogo, Sour, Yatenga, Bulkiené
Oeuvres du Sahel	1983	Française	Ganzourgon, Zoungou, Bougouriba, Oubritenga
Association Burkinabe de Recherche Action et Auto-formation pour le Développement (AREAD)	1983	Burkinabe	Dans toutes les provinces
Amitié des Peuples pour le Développement (APD)	1984	Burkinabe	Dans toutes les provinces
Union du Bon Samaritain	1984	Suisse	Dans toutes les provinces
Institut Technologique Dello (IT-DELLO)	1984	Française	Dans toutes les provinces
Société Internationale de Linguistique (SIL)	1985	Américaine	Ganzourgon, Bouet, Comé, Houboon, Sanguié, Sizilli, Sour
Movimento Sviluppo e Pace	1985	Italienne	Bulkiené
Organizzazione Dicolontariato Internazionale Cristiano (OZLTH BIEGANO)	1985	Italienne	Bulkiené, Sanguié
Air Secours International	1985		Gagna
Oeuvres Développement et Paix de la Sainte Famille	1985	Italienne	Radiogo
Terre des Femmes	1986	Suisse	Sourou
Médicos Mundis	1986	Italienne	Gourra
Association des Femmes Noires Américaines (ANFA)	1986	Américaine	Radiogo
Ligue Odontologique Internationale	1986		Gourra

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: Secours Mondial Luthérien	: ~1966	: Américaine	: Gagna
: Aurt Inanda	: 1966	: Indienne	: Oudalan
: Groupe pour les Relations : Transculturelles (GBT)	: 1996	: Italienne	: Kadiogo
: NOTIS Organization Neerlandaise : pour la coopération internationale: : au Développement	: 1986	: Neerlandaise	: Sourou, Séno, Oudalan, Sizilli

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*ETUDE DEMOGRAPHIQUE*

*PROJECTIONS DE LA POPULATION BURKINABE*

*POUR LES ANNES 1990, 1995 ET 2000*

*en Septembre 1988.*

*reçu par le World Bank  
le 19/01/89, The CNL 20  
PANE 134*



**S.E.P.I.A.**

**Société d'Etudes de Projets d'Investissement  
en Afrique**

**Rue Kwamé N'Eruma - Ouagadougou**

**BP : 1917 - TEL. : 33.32.10**

**BURKINA FASO**

*For exhaustive studies, the  
reader is referred to the World  
Bank Document Reference Guide  
in the 1987 volume.*

PROVINCE	POPULATION RESIDENTE			PROPORTION		Densité Habitants/Km <sup>2</sup>
	Ensemble	Hommes	Femmes	Hommes	Femmes	
01 - BAM	164.263	76.923	87.340	46,8	53,2	41
02 - BAZEGA	306.976	143.691	163.285	46,8	53,2	58
03 - BOUGOURIBA	221.522	106.058	115.464	47,9	52,1	31
04 - BOULGOU	403.358	194.421	208.937	48,2	51,8	45
05 - BOUKIEMDE	363.594	165.382	198.212	45,5	54,5	89
06 - COMOE	250.510	120.457	130.053	48,1	51,9	14
07 - GANZOURGOU	196.006	91.943	104.063	46,9	53,1	48
08 - GNAGNA	229.249	112.183	117.066	48,9	51,1	27
09 - GOURMA	294.123	146.287	147.836	49,7	50,3	11
10 - HOUET	585.372	293.372	291.659	50,1	49,9	35
11 - KAD'OGO	459.138	229.523	229.610	51,9	42,1	37
12 - KENEDOUGOU	139.772	69.571	71.221	49,0	51,0	17
13 - KOSSO	350.413	175.076	165.337	50,0	50,0	
14 - KOUTENGA	181.111	90.555	105.556	46,2	53,8	12
15 - MOUHOJN	229.213	142.220	146.993	49,2	50,8	28
16 - NAHOURI	105.273	51.154	54.119	48,6	51,4	27
17 - NAMENTENGA	198.798	96.598	102.200	48,6	51,4	26
18 - OUBRITENGA	303.229	139.454	163.775	46,0	54,0	65
19 - OUDALAN	105.715	52.233	53.482	49,4	50,6	11
20 - PASSORE	225.115	103.885	121.230	46,1	53,9	55
21 - PONI	234.501	113.684	120.817	48,5	51,5	23
22 - SAKAOUIE	218.289	102.603	115.686	47,0	53,0	42
23 - SANMATENGA	368.365	172.051	196.314	46,7	53,3	40
24 - SENO	230.043	115.280	114.763	50,1	49,9	17
25 - SISSILI	246.844	119.870	126.974	48,6	51,4	18
26 - SOUM	190.464	93.298	97.166	49,0	51,0	14
27 - SOUROU	267.770	129.910	137.860	48,5	51,5	28
28 - TAPOA	159.121	78.304	80.817	49,2	50,8	11
29 - YATENGA	537.205	248.328	288.877	46,2	53,8	44
30 - ZOUNDWÉOGO	155.142	73.708	81.434	47,5	52,5	45
Ensemble BURKINA FASO	7.976.019	3.846.518	4.129.501	48,2	51,8	29

Source : INSTITUT NATIONAL DE LA STATISTIQUE ET DE LA DEMOGRAPHIE

# DE LA POPULATION RÉPARTITION

## 1.2.1 Structure de la Population

Au recensement de 1985, on a compté une population résidente de 7.964.705 habitants.

Cette population se compose de 4.131.468 femmes contre 3.833.237 hommes soit un rapport de masculinité de 92,8 %.

Le tableau ci-après donne la répartition des personnes selon le groupe d'âge et le milieu de résidence.

Table 1.1: Répartition de 100 personnes de chaque sexe, selon le groupe d'âge et le milieu de résidence

GROUPE D'ÂGES	ENSEMBLE DU PAYS			MILIEU URBAIN			MILIEU RURAL		
	LES 2 SEXES	SEXE FEMININ	SEXE MASCULIN	LES 2 SEXES	SEXE FEMININ	SEXE MASCULIN	LES 2 SEXES	SEXE FEMININ	SEXE MASCULIN
TAL	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00
0 - 4	18,38	19,10	17,59	17,42	17,21	17,65	18,51	19,71	17,39
5 - 9	18,15	19,02	17,38	18,58	18,19	18,98	18,71	19,75	17,65
10 - 14	11,79	12,86	10,99	12,15	11,78	12,54	11,75	12,75	10,79
15 - 19	9,72	10,25	9,23	11,73	12,12	11,31	9,45	9,55	9,79
20 - 24	7,27	6,75	7,76	10,29	10,56	10,08	6,87	6,22	7,47
25 - 29	5,44	5,54	7,28	8,19	8,39	7,99	6,21	5,14	7,19
30 - 34	5,00	4,46	5,51	6,00	6,33	6,55	4,87	4,19	5,50
35 - 39	4,63	4,25	4,99	5,33	5,17	4,67	4,60	4,12	5,03
40 - 44	3,77	3,42	4,09	3,57	3,60	3,53	3,79	3,09	4,16
45 - 49	3,41	3,33	3,52	2,95	3,10	2,80	3,49	3,15	3,61
50 - 54	2,86	2,79	2,95	2,14	2,18	2,09	2,97	2,88	3,06
55 - 59	2,36	2,44	2,29	1,57	1,57	1,58	2,46	2,56	2,38
60 - 64	2,15	2,10	2,21	1,27	1,12	1,42	2,27	2,25	2,30
65 - 69	1,49	1,56	1,41	0,82	0,77	0,86	1,53	1,70	1,47
70 - 74	1,09	1,02	1,15	0,60	0,45	0,76	1,15	1,10	1,20
75 - 79	0,57	0,57	0,58	0,29	0,23	0,35	0,51	0,51	0,51
80 et +	0,86	0,71	0,99	0,51	0,29	0,74	0,90	0,77	1,03
0 - 14	48,3	50,6	46,1	45,2	44,2	46,2	48,7	51,7	46,0
15 - 64	47,7	45,3	49,8	52,6	54,1	51,1	47,0	44,1	49,7
65 et +	4,0	3,9	4,1	2,2	1,7	2,7	4,3	4,2	4,3

Source : Institut National de la Statistique et de la Démographie (INSD). Analyse des résultats définitifs du recensement de 1985 P. 152

Table 1.7: Evolution des différents indices démographiques de 1960 à 1985

NATURE DES INDICES		1960/61	1975	1985	
TAUX BRUT DE NATALITE (TBN EN ‰)		49,1	45	49,3	
TAUX DE FECONDITE PAR AGE	GROUPE D'AGES PAR ANNEES REVOLUES	15 A 19 ANS	224	171	151,9
		20 A 24 ANS	300	229	207,7
		25 A 29 ANS	264	204	181,1
		30 A 34 ANS	225	173	154,7
		35 A 39 ANS	158	103	93,7
		40 A 44 ANS	86	59	54,0
45 A 49 ANS	19	19	17,2		
TAUX GLOBAL DE FECONDITE GENERALE		199	212	223	
TAUX BRUT DE REPRODUCTION		3,0	3,2	3,5	
AGE MOYEN A LA PROCREATION EN ANNEES		27,9	28,9	29,4	
DESCENDANCE FINALE		6,04	6,55	7,1	
TAUX BRUT DE MORTALITE EN ‰		32	22	17,5	
ESPERANCE DE VIE A LA NAISSANCE EN ANNEES		32	42	48,5	
QUOTIENT DE MORTALITE INFANTILE EN ‰		174	167	154	
QUOTIENT DE MORTALITE JUVENILE		225	123	95	

SOURCE : Recensement INSD en 1975 et 1985

Nous assistons simultanément à une augmentation du taux de fécondité général et à une baisse de la mortalité qui accroît l'espérance de vie à la naissance passant de 32 ans en 1960-61 à 48,5 ans en 1985.

Sur une population de 7 679 539 individus nés et résidents au Burkina Faso, on a identifié 1 067 470 migrants internes durée de vie, soit 13,9 % de la population; En d'autres termes, une personne sur 6 au moins a résidé hors de sa zone de résidence actuelle.

Quant à la migration interne récente au cours de la période décembre 1984-décembre 1985, on a dénombré au total 135 527 individus et dont le rapport de masculinité est de 129,8 %. Si l'on tient compte de la population de référence en 1984 qui était de 7 640 583, on a un quotient de sortie à l'intérieur du Burkina Faso qui est de

$$\frac{135\ 527}{7\ 640\ 583} \text{ soit } 1,8 \%$$

Table 1.10: Indices de fécondité par département en 1976

MILIEU DE RESIDENCE	INDICES DE FECONDITE	
	TAUX DE FECONDITE	NOMBRE ENF/FEMMES
CENTRE	237	7
CENTRE EST	200	6,6
CENTRE NORD	172	6,8
CENTRE OUEST	200	6,8
EST	202	5,6
HAUTS BASSINS	200	8,4
NORD	205	6,7
SAHEL	169	5,1
SUD OUEST	188	6,4
MOUHOUN	217	6,4

La fécondité au Burkina Faso est relativement élevée par rapport à la moyenne africaine (taux brut de natalité 44 pour mille et nombre moyen d'enfants par femmes 6,3)\*



### 1.3.3 La mortalité

Les sources de statistiques sur la mortalité au Burkina Faso ne sont pas nombreuses. On peut citer l'enquête démographique de 1960-61, l'enquête sur la fécondité et famille de 1969, le recensement général de la population 1985. Des enquêtes de dimensions plus restreintes fournissent également quelques résultats sur la mortalité.

Les statistiques sanitaires sur les décès ne sont pas représentatives de la réalité, car elles ne concernent qu'une fraction des décédés dont la maladie a été traitée par un service de santé. P. CAUTRELLE estime qu'en 1960-61 un décès sur 44 était enregistré par les services de santé.

Depuis 1980-81, le nombre de formations sanitaires a certes augmenté, mais la représentativité des statistiques collectées ne semble toujours pas garantie pour permettre une étude démographique de la mortalité. Même le recensement de 1985 n'a pas échappé à ce problème, vu qu'on n'a fait qu'un seul passage en décembre 1985 ; généralement dans ce cas, on sous-estime les décès surtout dans les premières classes. Il faudrait donc ~~prendre avec beaucoup~~ prendre avec beaucoup de précaution les taux de mortalité obtenus et ce surtout pour la première et la deuxième classes (à savoir les mortalités infantile et juvénile).

Ceci dit, les décès de moins de cinq (5) ans non enregistrés au recensement de 1985 représentent plus de moitié (54,8 %) de l'ensemble des décès de l'année 1985 avec respectivement 24,3 % et 30,5 % pour les décès à moins d'un an et ceux dont l'âge est compris entre 1 et 4 ans.

On voit ainsi que les taux de mortalité infantile et juvénile restent encore très élevés même s'il y a eu dans le temps une diminution.

Nous obtenons à titre indicatif selon les différents recensements l'évolution de la mortalité suivante :

	1960-61	1975	1985
Taux brut de mortalité en %	32	22	17,5
Espérance de vie à la naissance	32	42	48,5

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4. Population Reference Bureau, INC, 1988

Table 1.12: Taux de mortalité (en %) par groupe d'âges et milieu de résidence

GROUPE D'AGES	MILIEU URBAIN	MILIEU RURAL
Moins de 1 an	107,37	161,26
1 A 4 ANS	20,54	27,22
5 A 9 ANS	3,36	5,91
10 A 14 ANS	1,88	3,74
15 A 19 ANS	2,27	4,80
20 A 24 ANS	2,45	5,01
25 A 29 ANS	2,72	5,09
30 A 34 ANS	3,22	5,58
35 A 39 ANS	3,67	5,09
40 A 44 ANS	4,97	7,20
45 A 49 ANS	5,19	7,94
50 A 54 ANS	8,39	10,35
55 A 59 ANS	10,37	13,04
60 A 64 ANS	15,00	19,07
65 A 69 ANS	48,44	58,21
70 A 74 ANS	68,20	80,21
75 ET PLUS	395,52	457,84

De nombreux facteurs sont à l'origine de cette inégalité des chances de survie selon le milieu de résidence. On pourrait citer entre autres, l'inégale répartition aussi bien des infrastructures sanitaires que du personnel médical selon le milieu, sans oublier les conditions d'hygiène et d'alimentation qui sont meilleures en ville du fait des revenus du citoyen.

L'évaluation des données sur la mortalité révèle une sous-estimation des décès au recensement de 1985, d'où la nécessité de procéder à des ajustements. Ce qui montre que nos statistiques sanitaires sont encore peu fiables et les projections démographiques à partir de ces données brutes ne peuvent avoir qu'une signification limitée.

# URBAN / RURAL FIGURES

De ce tableau, on peut dégager les observations suivantes :

- une population plus grande de personnes de moins de 15 ans en milieu rural (48,7 %) contre 44,2 % en milieu urbain ;
- une population de 51 % de personnes potentiellement active en ville contre 44,2 % en milieu rural ;
- les femmes en âge de procréer représentent 42 % de la population féminine rurale contre 44 % en milieu urbain.

On note également que la population urbaine qui ne représente que 12,7 % de la population totale (cf. tableau ci-dessus) comporte une majorité de plus de 51 % d'hommes alors que la population féminine rurale est majoritaire avec plus de 52 %. Ce fait est dû en partie à la migration qui frappe beaucoup d'hommes valides à la recherche de l'emploi, soit en zone urbaine soit à l'étranger, soit encore dans les zones où les conditions climatiques sont plus favorables.

Dans l'ensemble, la structure de la population du Burkina Faso en 1985 se caractérise par une forte proportion de jeunes de moins de 15 ans ; la tendance au rajeunissement va se poursuivre encore sous le double effet de la baisse la mortalité infantile, consécutive à l'amélioration des conditions de vie et de la forte fécondité dont une diminution significative ne pourrait avoir d'effet que dans une quinzaine d'années au moins. Cette structure se caractérise par un déficit masculin aux âges actifs notamment dans le milieu rural, résultat de l'effet combiné de l'exode et de l'émigration. Ce qui aura des conséquences néfastes sur le niveau de production agricole, si les moyens de travail restent à leur état actuel.

Table 1.2: Principaux indicateurs d'évolution de la population urbaine

ANNEE	EFFECTIF DE LA POPULATION URBAINE	TAUX URBANISATION %
1960-61	209.874	4,7
1975	382.610	8,4
1985	1.011.074	12,7

Source : INSD. Analyse des résultats définitifs, P. 200.

Table 2.4: INVENTAIRE DU PERSONNEL MEDICAL PAR PROVINCE

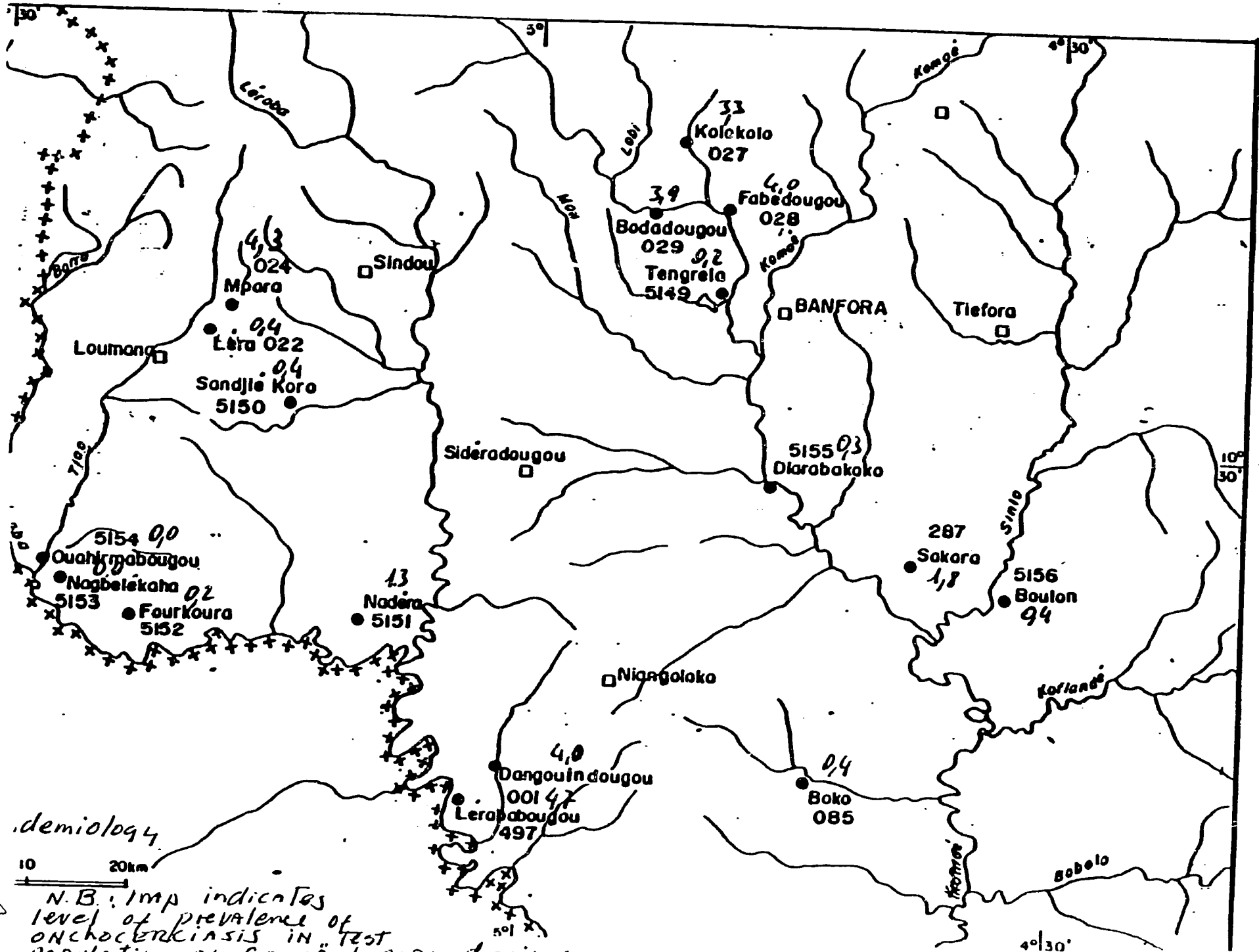
	MEDECINS	NORME OMS	ASP	IE	IB	SAGE FEMME
BAZEGA	1	29	54	31	7	7
BANTOUREOU	1	15	5	9	20	9
YADIBAO	55	42	310	192	7	7
NAHCOURI	1	10	6	5	8	2
OUBRITENGA	1	29	24		60	7
ZOUNKWEOGO	1	15	16		19	1
BAR	1	15	23	6	12	7
NAMENTENGA	1	19	139	1	9	2
SANPATENGA	3	36	7		40	7
OLDALAN	2	10	14	0	10	3
SOJA	1	17	7	7	7	7
SENO		22				
TAPQA		15				
GNAGNA	2	22			8	3
SOUMA	5	15	25	12	30	6
PASSORE	3	21	24	28	7	7
YATENGA	9	52	58	69	7	10
BOULXIEMDE	12	35	42	20	50	10
SANGUE	1	20	40	7	11	2
SISSILI	1	23	17	6	11	1
BOULSOU	3	38	7	22	32	5
KOURITENGA	1	19	42	7	15	3
BOUGOURIBA	2	21	35	7	29	7
PONI	2	22	171	0	51	0
CONGE	3	24	7	7	7	7
HOUET	26	54	50	59	144	7
KENEDOUGOU	1	13	14	9	19	2
KOSSI	6	30	5	0	34	0
MOUHOUN	6	27	28	7	51	7
SOJROU	3	25	5	7	38	4

avec : ASP : assistant de santé primaire

IE : infirmier d'Etat

IB : infirmier breveté

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demiology

10 20km

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N.B.: Imp indicates level of prevalence of ONCHOCERCIASIS IN TEST population of LERABA drainage area.

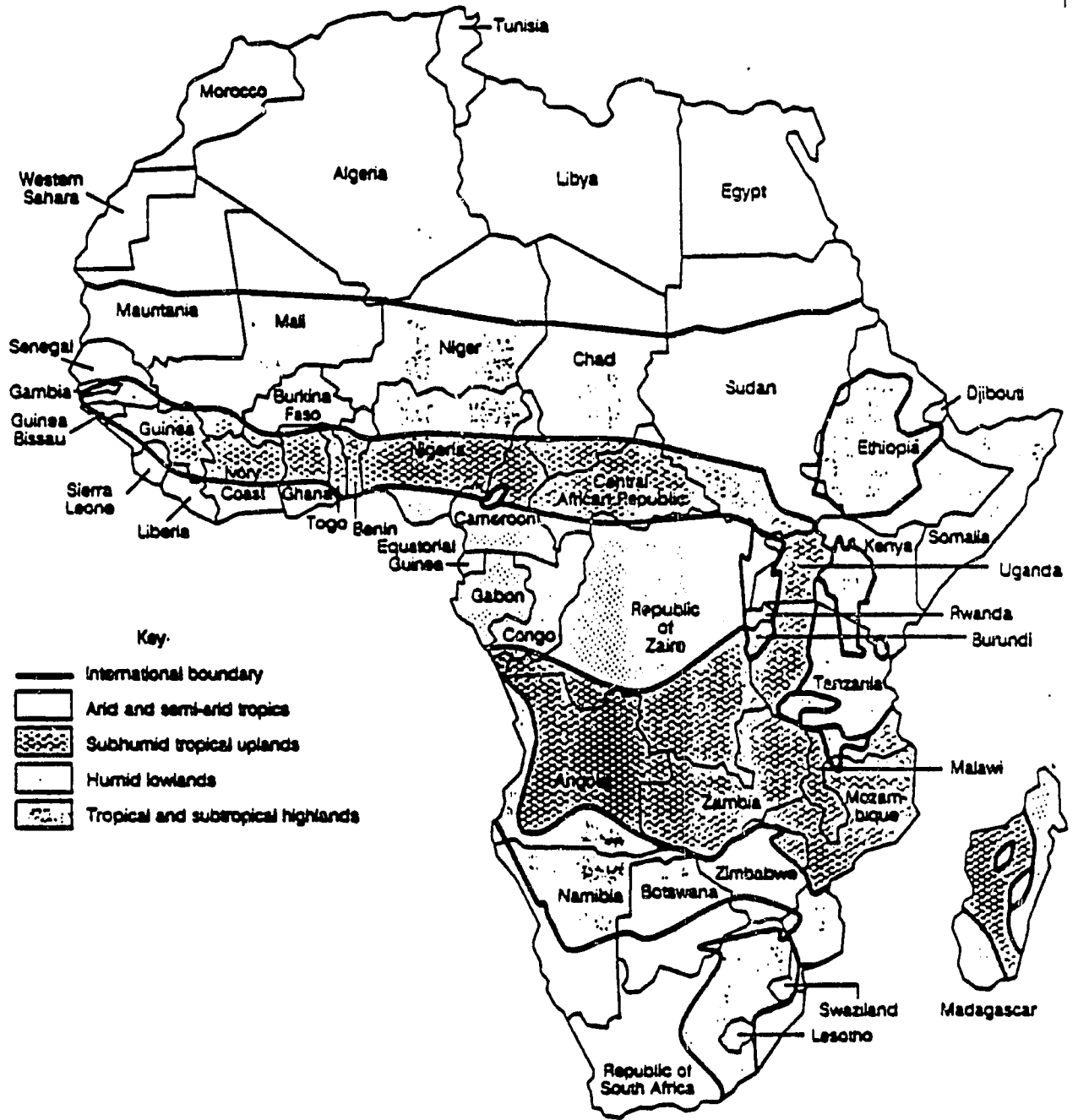
Table 2.3: Taux de scolarisation et d'alphabétisation par province

REGION DE PLANIFICATION	PRIMAIRE EN %	SECONDAIRE EN %	ALPHABE. EN %
<b>REGION DE PLAN. 1</b>			
EAZEGA	12,4	0,71	7,8
GANZOURGOU	11,4	0,84	5,6
KADIOGO	58,1	25,15	44,9
NAHOURI	22,6	2,60	4,6
OUBRITENGA	17,2	1,50	8,2
ZOUDWEOGO	13,7	0,86	7,0
<b>REGION DE PLAN. 2</b>			
BAM	15,5	1,41	11,7
NAMATENGA	8,6	0,72	8,2
SANMATENGA	13,9	2,24	7,2
<b>REGION DE PLAN. 3</b>			
OU DALAN	7,4	PAS D'INFO	6,6
SOUM	7,2	0,87	7,3
SENO	5,0	0,75	5,4
<b>REGION DE PLAN. 4</b>			
TAPOA	9,3	1,05	5,1
GNAGNA	3,2	0,49	3,5
GOURMA	10,6	2,30	6,5
<b>REGION DE PLAN. 5</b>			
PASSORE	16,8	1,64	7,8
YATENGA	16,2	3,14	10,6
<b>REGION DE PLAN. 6</b>			
BOULKIEMDE	24,7	5,2	12,1
SANGUIE	20,5	1,04	9,8
SISSILI	16,9	1,07	10,7
<b>REGION DE PLAN. 7</b>			
BOULGOU	19,4	2,02	8,0
KOURITENGA	20,7	1,66	9,4
<b>REGION DE PLAN. 8</b>			
BOUGOURIBA	22,7	2,54	8,8
PONI	20,0	2,28	7,1
<b>REGION DE PLAN. 9</b>			
COMOE	23,3	5,28	13,7
HOUET	35,3	13,25	27
KENEDOUGOU	22,0	1,41	13,8
<b>REGION DE PLAN. 10</b>			
KOSSI	11,0	0,96	14,8
MOUHOUN	21,5	3,04	13,6
SOUROU	10,5	2,08	11,9
<b>ENSEMBLE DU PAYS</b>	<b>19,8</b>	<b>4,63</b>	<b>-</b>

Les taux de scolarisation, faibles dans l'ensemble, sont très variables selon les régions du Burkina Faso. Le plateau mossi a une scolarisation relativement basse, les taux variant de 10 à 30 %. C'est la province du Kadiogo dont Ouagadougou fait partie qui a le taux le plus élevé (plus de

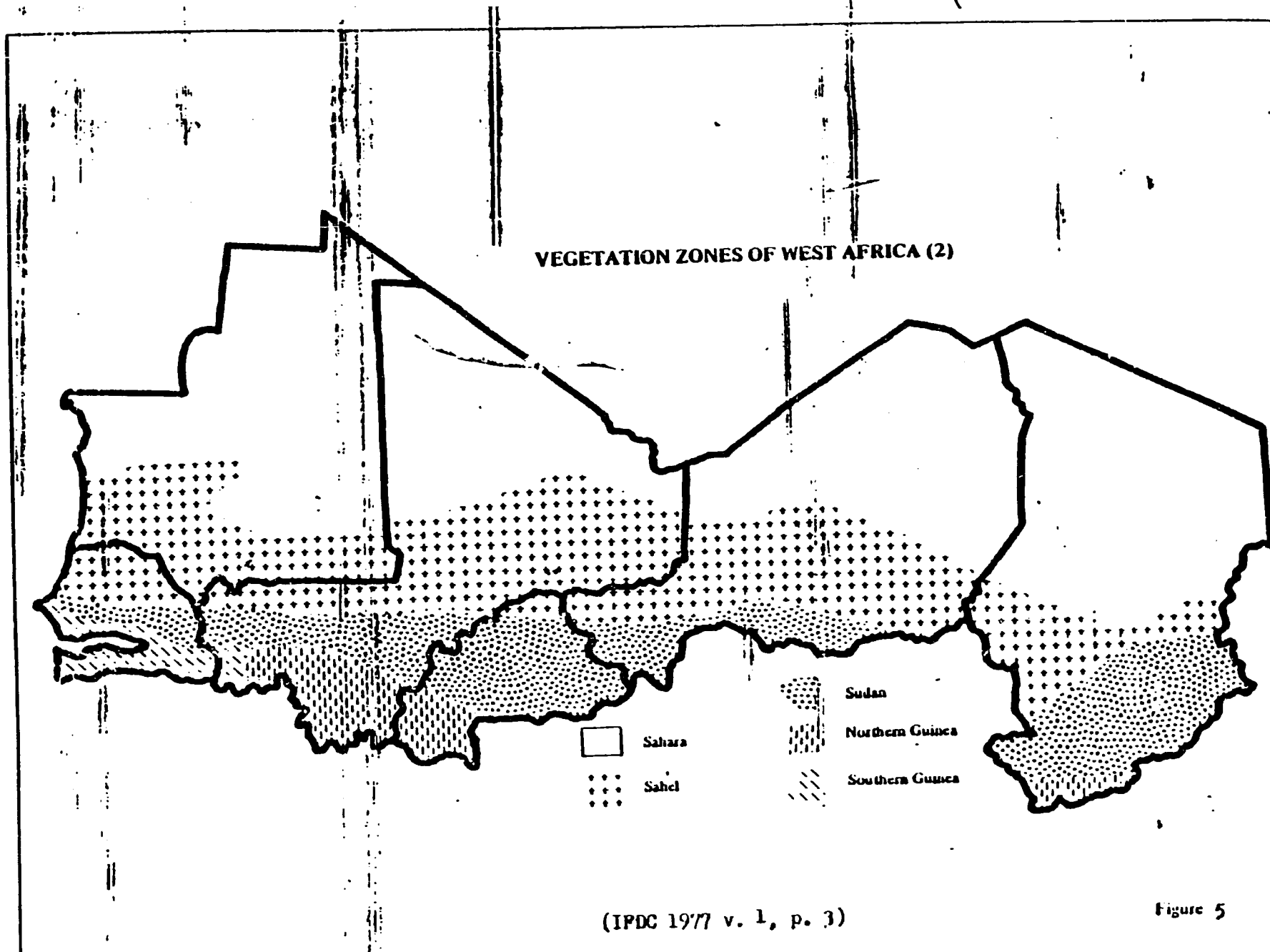
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# BURKINA FASO Climatic Zones



SOURCES: Adapted from U.S. Agency for International Development, *Plan for Supporting Natural Resources Management in Sub-Saharan Africa*, (Washington, D.C.: USAID, February 1987). Zonation for Madagascar from U.N. Food and Agriculture Organization (FAO), *African Agriculture: The Next 25 Years - Ales of African Agriculture* (Rome: FAO, 1988); International Livestock Center for Africa (ILCA), *ILCA Annual Report 1983* (Addis Ababa, Ethiopia: ILCA, 1983).

Source: M. D. Saunders  
Farming Systems Research  
Working Paper 4/1980 - L

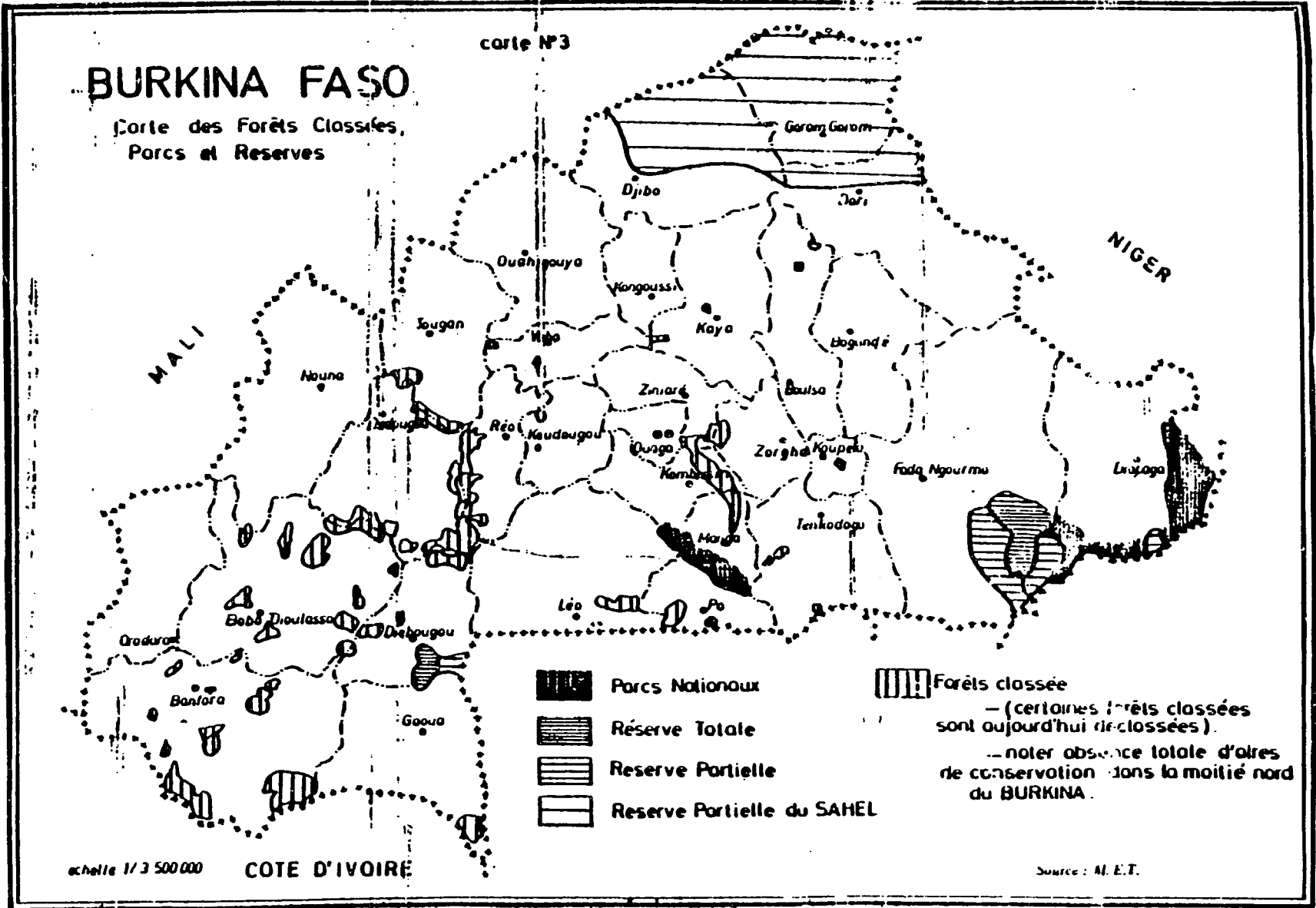


(IPDC 1977 v. 1, p. 3)

Figure 5

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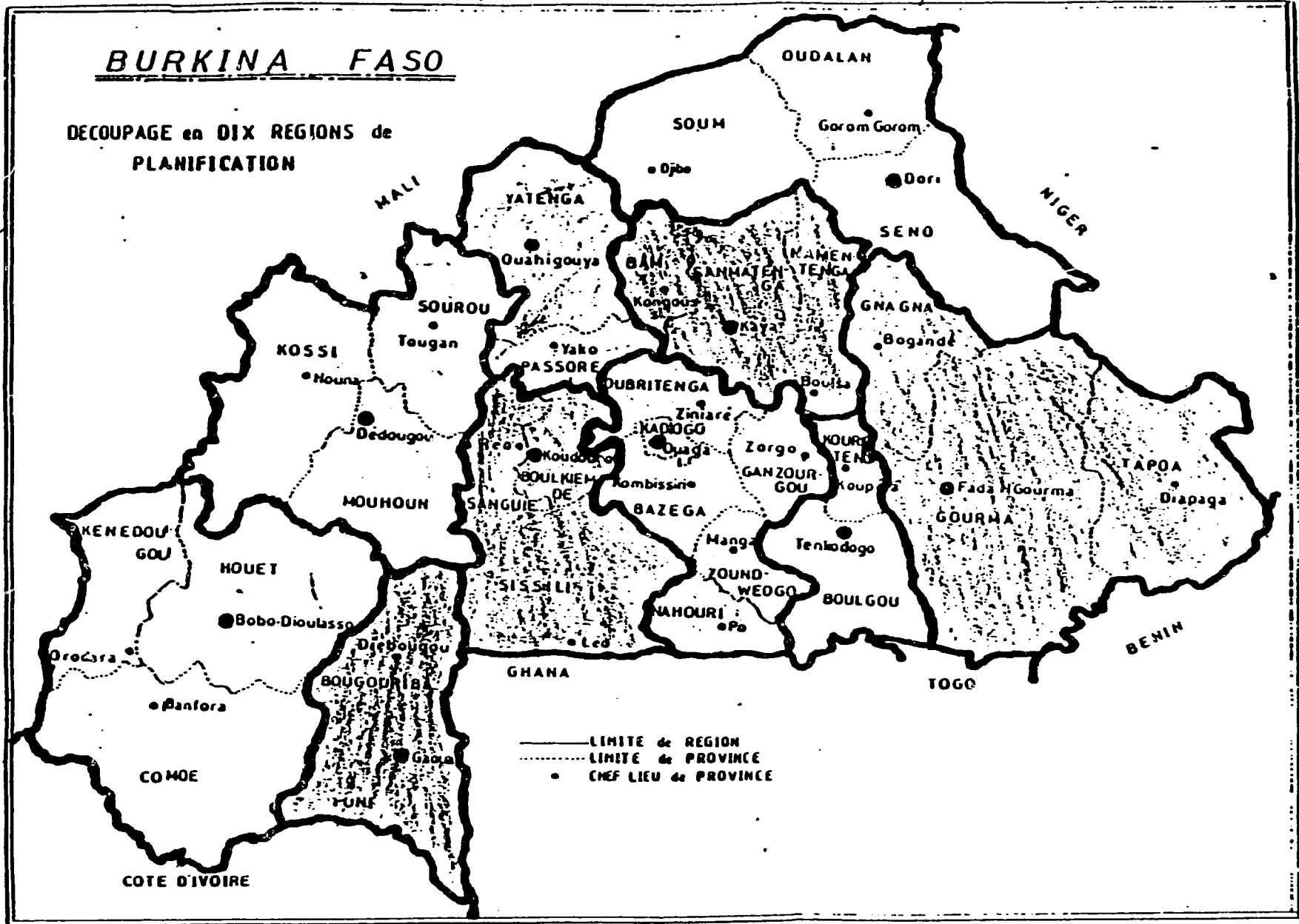


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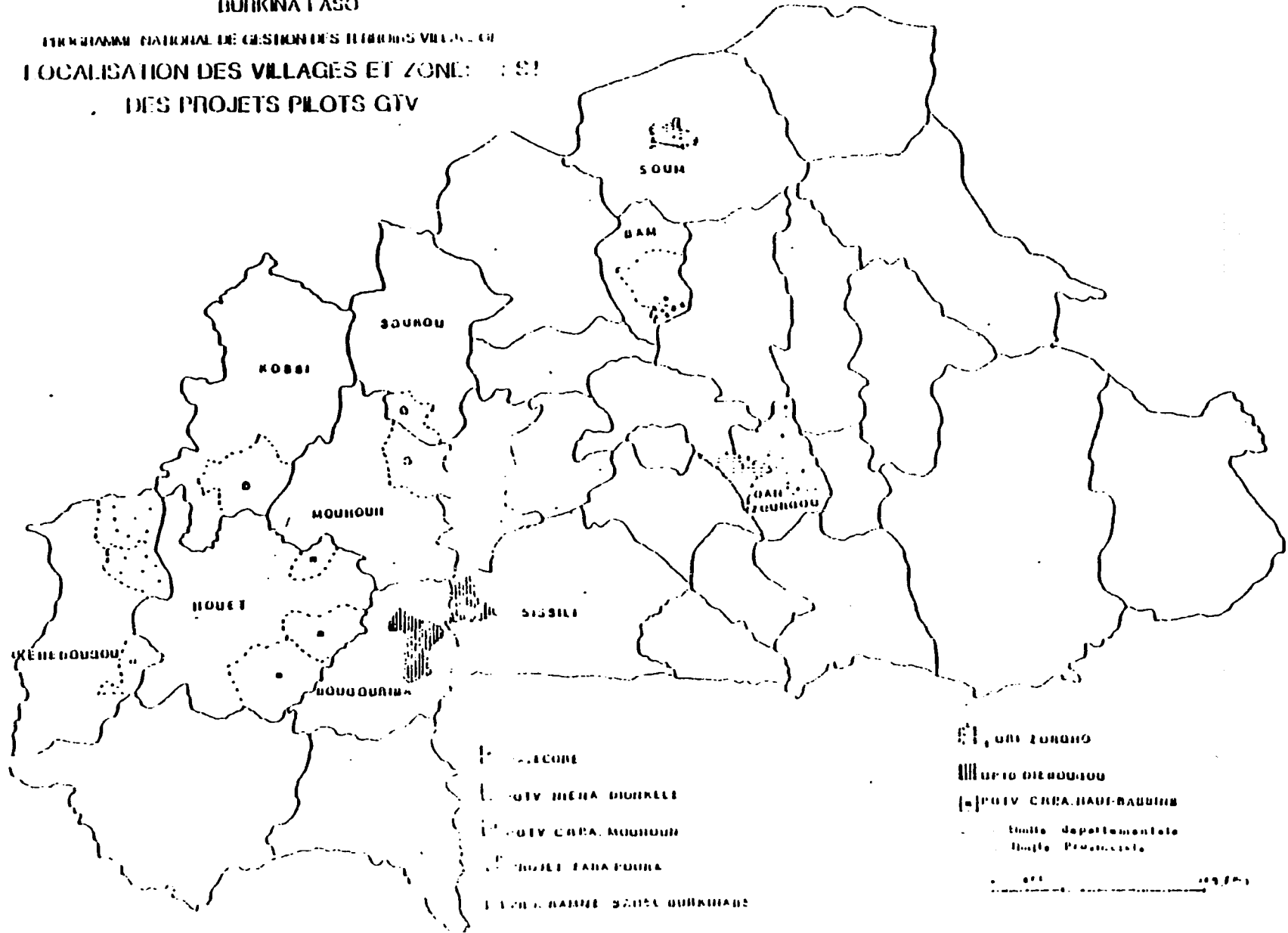
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BURKINA FASO

TERMINAAM NATIONAL DE GESTION DES TERRAINS VILLAGES  
 LOCALISATION DES VILLAGES ET ZONES  
 DES PROJETS PILOTS GTV

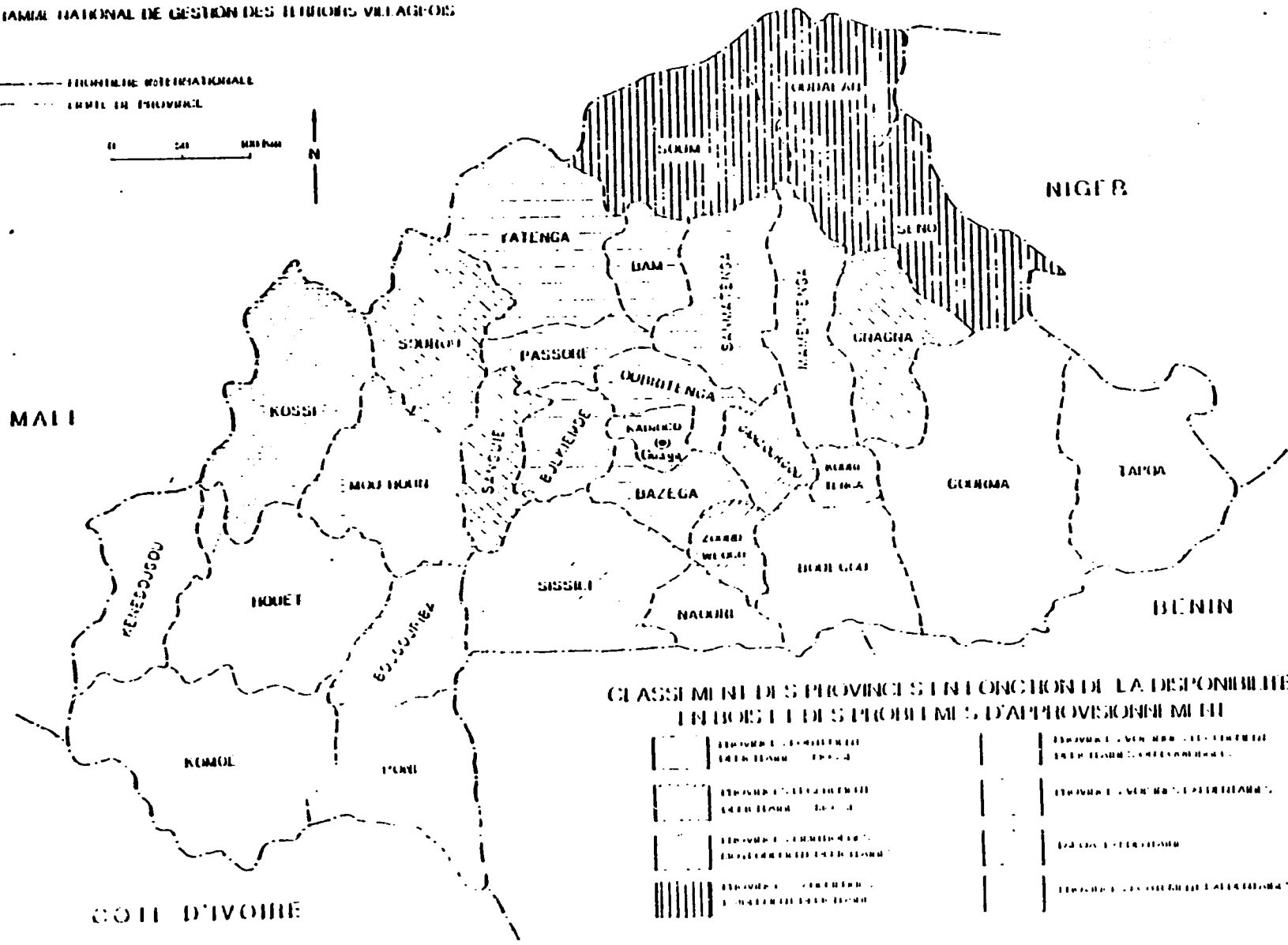
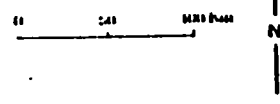


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**BURKINA FASO**  
**PROGARAMME NATIONAL DE GESTION DES TERRAINS VILLAGEOIS**

----- FRONTIERE INTERNATIONALE  
 - - - - - LIMITE DE PROVINCE



**CLASSIFIEMENT DES PROVINCES EN FONCTION DE LA DISPONIBILITE  
 EN BOIS ET DES PROBLEMES D'APPROVISIONNEMENT**

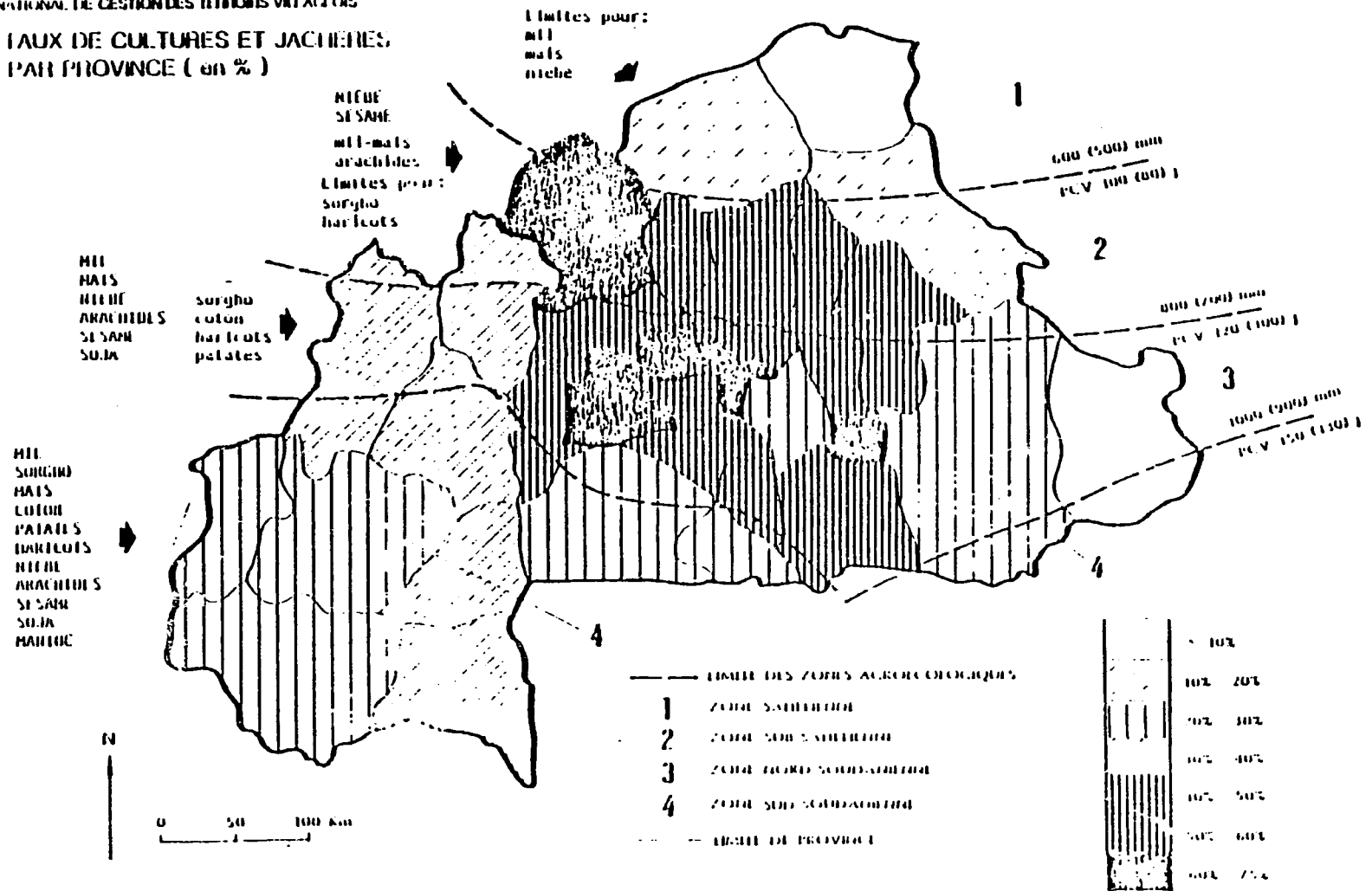
	PROVINCE A DISPONIBILITE EN BOIS FAIBLE		PROVINCE A DISPONIBILITE EN BOIS MOYENNE
	PROVINCE A DISPONIBILITE EN BOIS FAIBLE		PROVINCE A DISPONIBILITE EN BOIS MOYENNE
	PROVINCE A DISPONIBILITE EN BOIS FAIBLE		PROVINCE A DISPONIBILITE EN BOIS MOYENNE
	PROVINCE A DISPONIBILITE EN BOIS FAIBLE		PROVINCE A DISPONIBILITE EN BOIS MOYENNE

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**BURKINA FASO**

PROGRAMME NATIONAL DE GESTION DES TERRES VITAEURS

**CARTE DU TAUX DE CULTURES ET JACHERES  
PAR PROVINCE ( en % )**

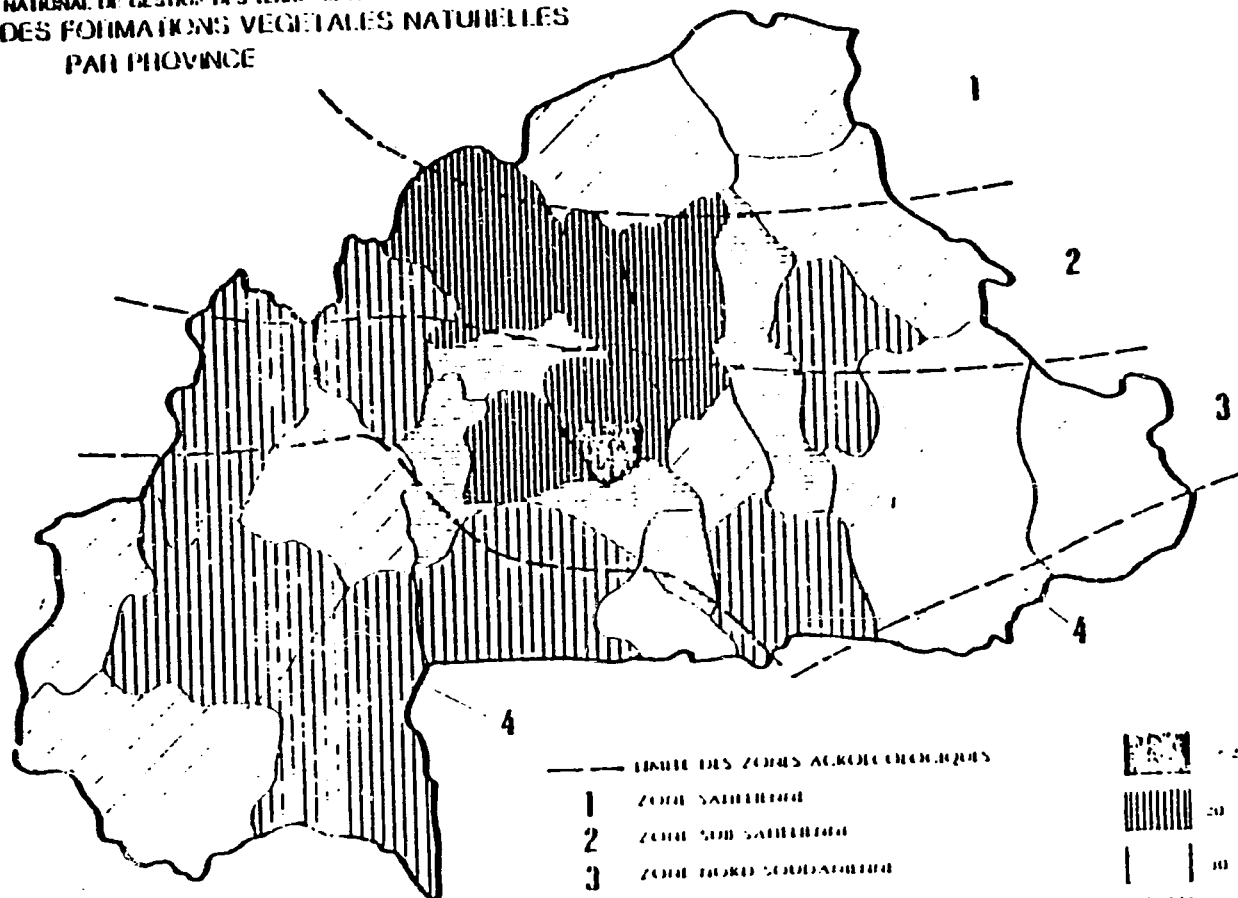


NOTE: ESPÈCES CULTIVÉES

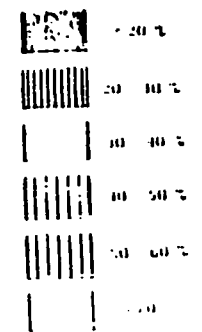
en majuscules: sans contraintes climatiques majeures  
en minuscules: avec contraintes climatiques majeures

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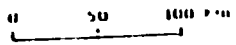
BURKINA FASO  
 PROGRAMME NATIONAL DE GESTION DES TERRES ET VILLAGES  
 POURCENTAGE DES FORMATIONS VEGETALES NATURELLES  
 PAR PROVINCE



— LIMITE DES ZONES AGROECOLOGIQUES  
 1 ZONE SAHELIENNE  
 2 ZONE SUD SAHELIENNE  
 3 ZONE NORD SAHELIENNE  
 4 ZONE SUD SAHELIENNE  
 - - - LIMITE DE PROVINCE



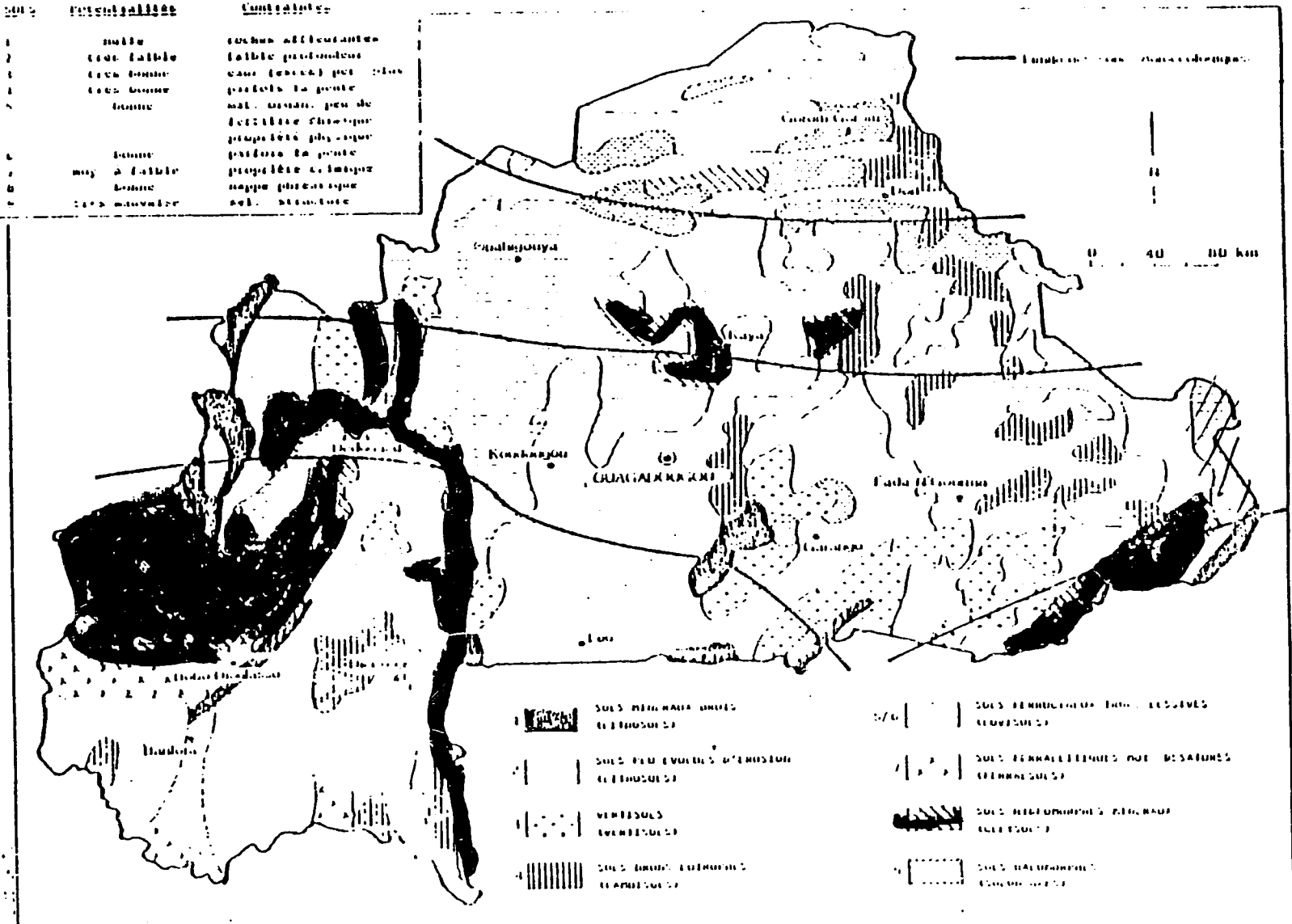
N



165

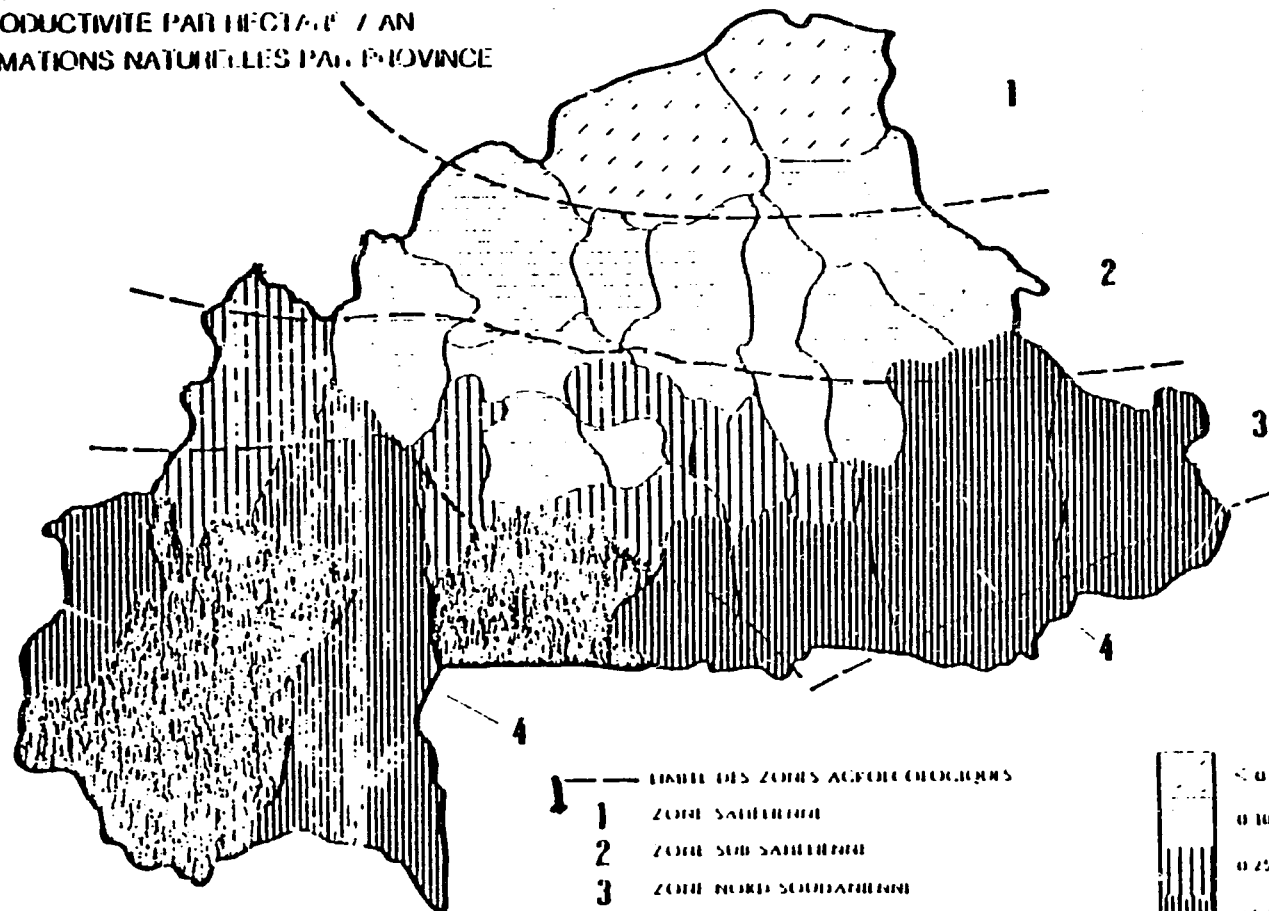
BUKINIA FASO  
 ISROJAMM BATHIWA TA CAJICHERS BITHONE VIKACOR.  
 CARTE DES SOIS

SOIS	Potentiaallite	Contidites
1	nulle	rochers affleurantes
2	très faible	faible profondeur
3	très bonne	caus (sca) peu plus
4	très bonne	parfois la pente
5	bonne	mal usant, peu de
		fertilité chimique
6	bonne	propriété physique
7	moj à faible	parfois la pente
8	bonne	propriété chimique
9	très mauvaise	nappé phréatique
		sol. structure

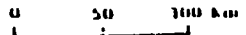
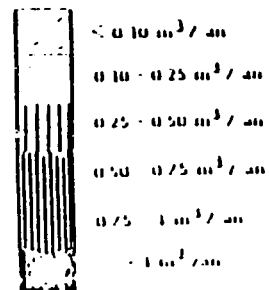


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BURKINA FASO  
 PROGRAMME DE GESTION NATIONALE DES TERRES VILLAGEOISES  
 PRODUCTIVITE PAR HECTAIRE / AN  
 DES FORMATIONS NATURELLES PAR PROVINCE



- LIMITE DES ZONES AGROECOLOGQUES  
 1 ZONE SAHELIENNE  
 2 ZONE SUB SAHELIENNE  
 3 ZONE NORD SOUDANAIENNE  
 4 ZONE SUD SOUDANAIENNE  
 - - - LIMITE DE PROVINCE

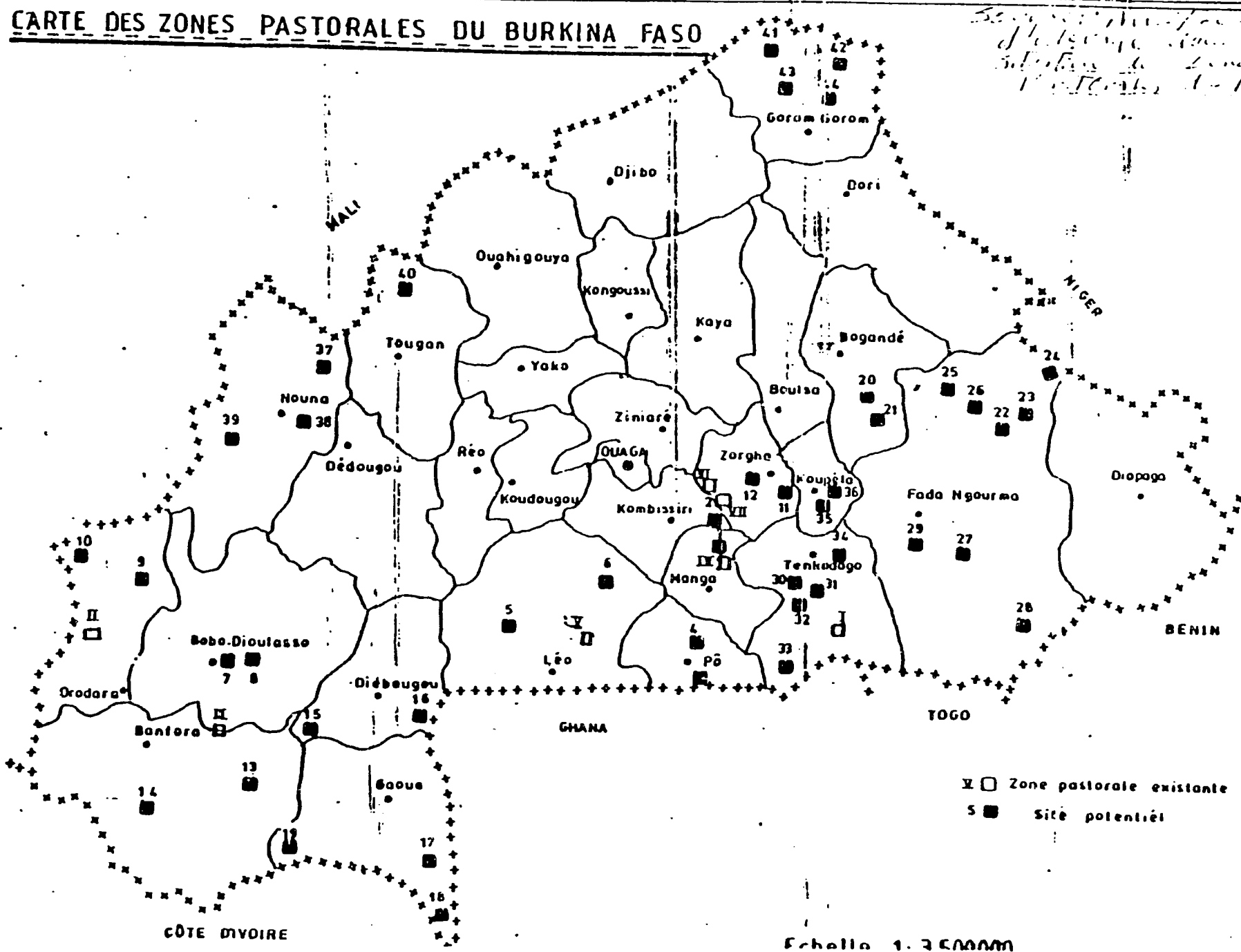


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# CARTE DES ZONES PASTORALES DU BURKINA FASO

*Handwritten notes:*  
 Carte des zones pastorales  
 de l'ensemble des zones  
 du Burkina Faso  
 1/50



X □ Zone pastorale existante  
 S ■ Site potentiel

Echelle 1 : 2 500 000

1/50

CODE D'IDENTIFICATION DES SITES  
POTENTIELS DE ZONES PASTORALES

N°	SITES	N°	SITES
1	Luli-Nobéré	23	Matiassoali II
2	Gaongo Sud	24	Matiassoali III
3	Po (Est Nazinga)	25	Gayéri
4	Guïro (Sud Tambi)	26	Fadā
5	Rabou	27	Kompienga
6	To	28	Madjoari
7	Souroukoudinga	29	Comin-yanga
8	Boni	30	Niassa
9	Plains de N'Dorola	31	Tcherbo
10	Plains de Ténéténesso	32	Danbégué
11	Bourouma	33	Zouaga
12	Kulkanda	34	Sablogo
13	Bougoula	35	Tensobentenga
14	Ouarigolodougou	36	Gouaghin
15	Diassara	37	Barani
16	Zambo	38	Nouna plains de Vouahou
17	Batié	39	Tansila-Dokuy
18	Kpéré	40	Toéni-Gomboro
19	Djigoué	41	Forage Christins
20	Kogadou	42	Béli
21	Sinkontou	43	Mars d'Oursi
22	Matiassoali I	44	Mars de Markoye

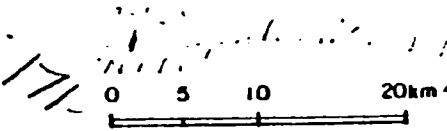
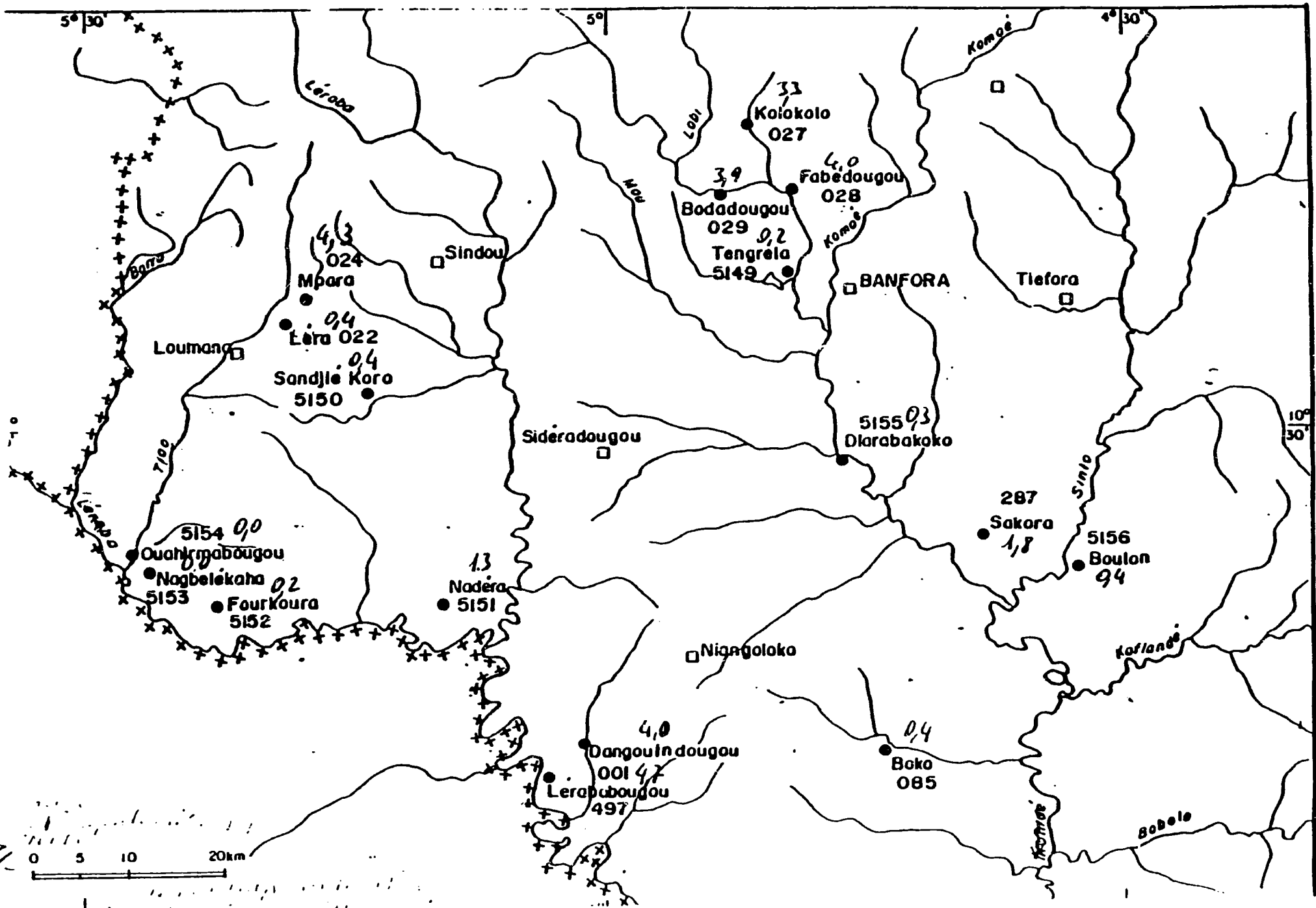
CODE D'IDENTIFICATION DES ZONES  
PASTORALES EXISTANTES

- |                    |                 |
|--------------------|-----------------|
| I - NOUBAO         | IV - SONDRÉ-EST |
| II - CEZIET        | V - YALLE       |
| III - SIDERADOUGOU | VI - GADEGRIN   |
| VII - MANKARCA     |                 |

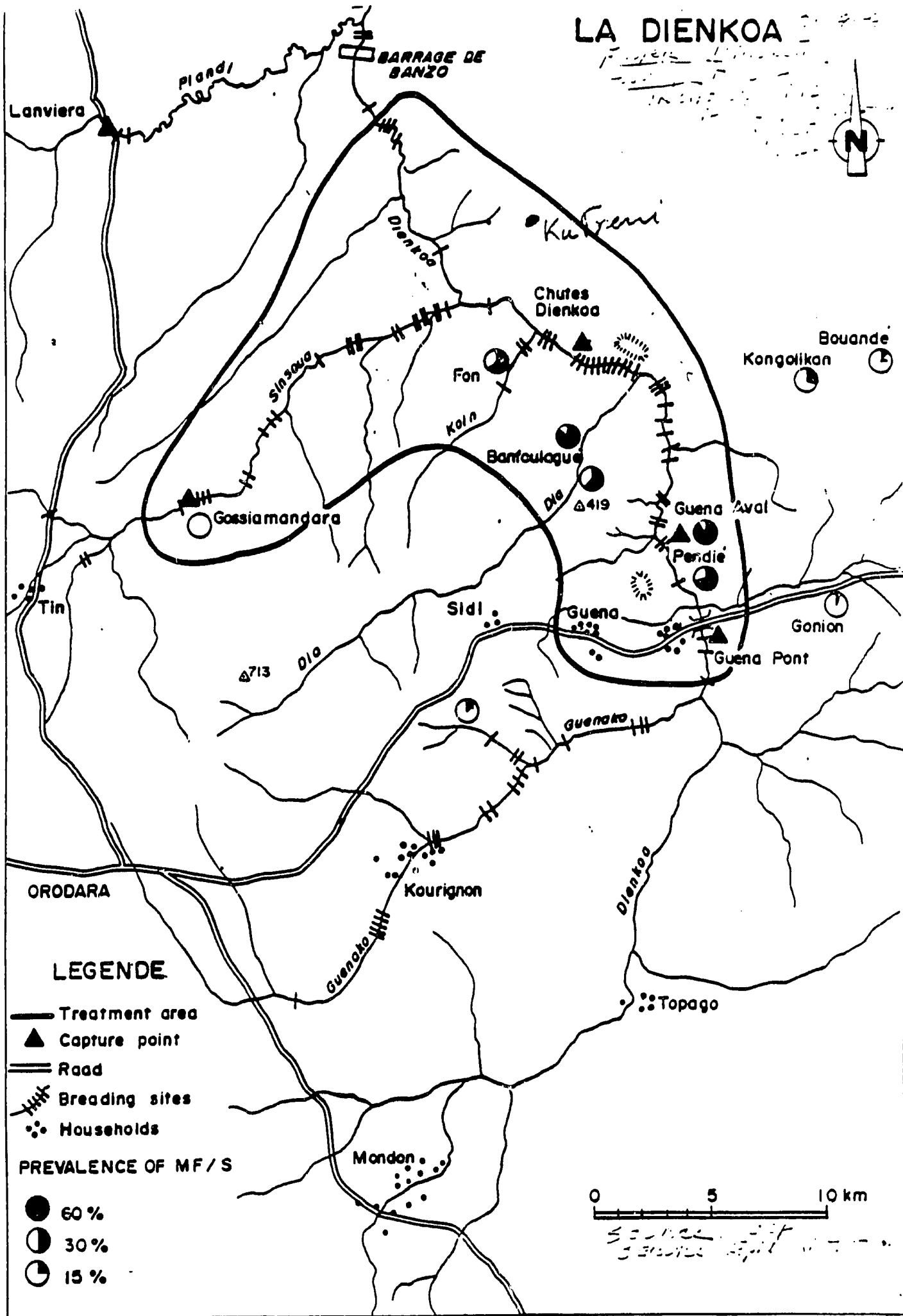
**SITUATION DES SITES POTENTIELS DE ZONES PASTORALES DU BURKINA FASO (au 10/04/1990)**

CRPA	PROVINCES	ZONES PASTORALES	SUPERFICIE (ha)
CENTRE-SUD	ZOUNDWEGOU	Louli-Nobéré	20.000
	BAZEGA	Gaongho-Sud	12.000
	NAROURI	Po (Est-Nazinga)	30.000
		Ariaro (Sud Tambi)	28.000
TOTAL			90.000
CENTRE-OUEST	SICSTI	Nabou	20.000
		To	18.000
TOTAL			38.000
HAUTS-BASSINS	BOUET	Souroukoudingu	2.000
		Roni	1.500
	KEREBOUGOU	Plaine de N'Dorola	2.700
		Plaine de Téméténesso	2.900
TOTAL			9.100
CENTRE	GANZOURGOU	Bourouma	6.500
		Kulkanda	7.000
TOTAL			13.500
COMOE	COMOE	Bourouma-Douloufa	92.000
		Ouangolodougou	60.000
TOTAL			152.000
SUD-OUEST	BOUGOURIBA	Diaassara	80.000
		Zambo	1.500
	PONI	Batié	18.000
		Kpéré Djigoué	4.000 14.000
TOTAL			57.500
EST	GRAGNA	Kogodou	8.000
		Sinkontou	37.000
	GOURMA	Matiacoali I	108.100
		" II	87.000
		" III	124.000
		Gyéri	226.000
		Pada	10.825
		Zone Sylvopastorales Kimpinga	40.000
Madjoari	130.000		
Camin-yanga	55.000		
TOTAL			824.225
CENTRE-EST	BOULGOU	Massa	19.000
		Tcherbo	6.300
		Danbégué	7.000
		Zoaga	50.000
		Sablogo	30.000
	KOURITENGA	Yensobentenga	4.637
Gounghin		14.800	
TOTAL			131.737
MOUBOUR	KOSSI	Barani	70.000
		Nouna (Plaine de Voum-hou)	30.000
	SOUROU	Tansila - Dokuy	40.000
Tosni-Gomboro		230.000	
TOTAL			370.000
SABEL	OUDALAN	Forage Christine (zone)	30.000
		Béli	50.000
		Mars d'Oursi	15.000
		Mars de Darkoye	12.000
TOTAL			107.000

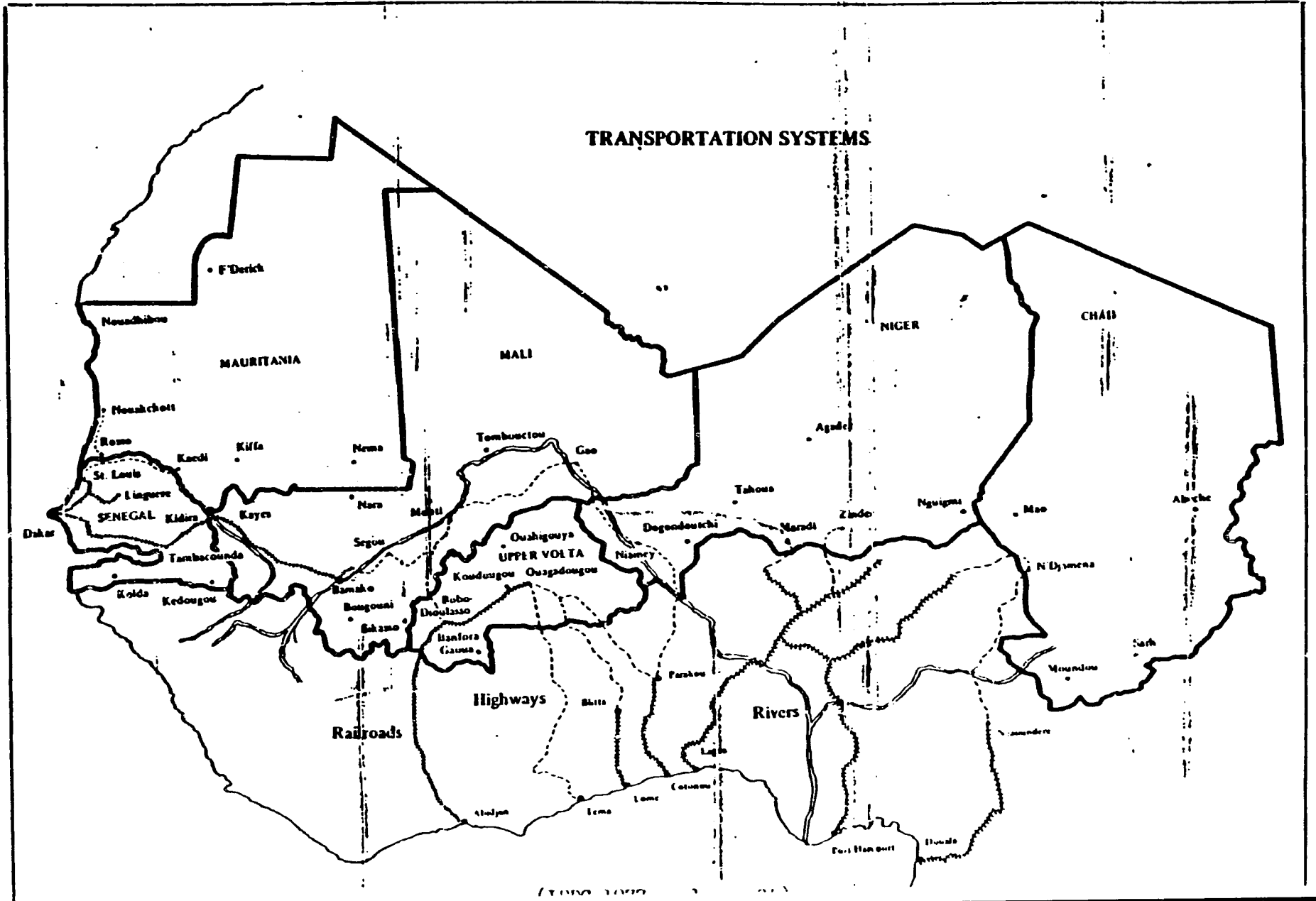
Superficie Totale Zones Pastorales Potentielles : 1.996.462 ha  
 N.B : L'identification de sites potentiels au Yatenga, au Soum et au Séno est en cours.



# LA DIENKOA



# TRANSPORTATION SYSTEMS



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**ANNEX THREE**  
**ANNEXES TO CHAPTER THREE**

**ANNEX THREE**

**ANNEXES TO CHAPTER THREE**

**ANNEX A**

**ZONATION IN THE TERROIRS**

The zonation process involves both land use planning and negotiations between *groupements* and CRPA agents. The zones include those to be used for agriculture, forestry (*mise en défense*), and pasture. (Agricultural fallow or reserve is often part of the agricultural zone.) This particular zonation appears to be a condition that must be accepted by the *groupement* before it can establish a GTV program.

To delimit the *terroir* and the zones, CRPA geographers use aerial photographs and consultations with *groupement* members. Village members seem to have a good sense where the Terroir ends. Once delimited the CRPA personnel use various biophysical parameters (soil type, slope, vegetative cover, etc) to establish the above three zones. Concurrently, the *groupement* does its "zonage" according to its own criteria. In places where we checked, there were few discrepancies between the *groupement* and the CRPA choices.

In case of a difference of opinion between CRPA agents and *groupement* members, negotiations take place. We were told that if the differences are not major, the *groupement* classification is adopted.

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## ANNEX B

### SUMMARY OF GTV ELEMENTS: OVERVIEW AND SUGGESTED NEXT STEPS

#### Target of the GTV Component

The target is to assist members of each participating terroir to achieve sustainable increases in yields and income through better management of natural resources. In this context, management of natural resources includes agricultural, forestry and livestock activities within the terroir. Major purposes of this component include (a) stabilizing the areas of annual crop production by increasing agricultural productivity and generating sufficient benefit streams from management of forestry and range lands such that a portion of that stream can be reinvested in those lands.

#### Premises

1. SW is area of high potential both for productivity and degradation. Sustainable economic development depends upon the latter being addressed sooner than later. In particular, the annual crop production units must be stabilized before there is a long-term perspective for maintaining forest and range lands.
2. There is a learning curve for dealing with sustainable development. People have been dealing with a degrading environment and economy for over 20 years. This project should aim to capitalize on that base of knowledge and experience.
3. Knowledge needs to be shared to be useful. The three partners-the *groupements*, the GOBF, and donors-need to share knowledge about past experiences. (A corollary here is that in many cases, providing a set of NRM options and establishing the conditions that favor adoption of appropriate options is more effective than prescribing solutions.)
4. This project will complement other, ongoing actions such as the ARTS Project and the PNGTV program.
5. A summarizing premise for this component is that we do not have to wait for technological breakthroughs to make significant progress toward this target. To the contrary, waiting for breakthroughs before aggressive action is taken will raise the price many times over of achieving the target.

#### Problem Analysis

At the level of the *terroir*, this project attacks the problems posed by degradation of soil, forestry and range resources. The solution lies in managing these resources such that sufficient benefit streams are produced for a portion to be continually invested back into these resources. Concomitant to this "enterprise" approach to NRM, is the goal of stabilizing the production area of crops.

In this section soil degradation caused by poor fertility and conservation will be addressed. Other sections deal with forest and range resources management.

### **Biophysical Constraints**

Once the vegetative cover is removed and the soil exposed to the intensive rainfall events of the area, degradation can be rapid-both physically and chemically. The solutions that this project can support include (a) keeping the soil in place and (b) maintaining soil organic matter.

Contour dikes, windbreaks, vegetative bands, mulching etc. are being used to hold soil in place. Composting and turning under crop residue are practiced by farmers to maintain (and increase) soil organic matter.

### **Policy and Socioeconomic Constraints**

Wide-spread adoption of practices addressing the above is favored by the following conditions:

- Use rights over the products of better management.
- Access to markets and credit in order to purchase oxen and traction equipment. (Tied to this constraint is the need to diversify away from the cotton-based economic base.)
- Access to knowledge about appropriate techniques

It is these three constraints or elements that identify the targets of this component.

### **Elements of GTV Component**

#### **Strengthening Groupement Organizational Capacity**

This element aims to provide members of the *terroir* with access to markets and credit, with increased capacity to negotiate appropriate RAF provisions, and to seek appropriate assistance (on a partnership basis) from development agencies.

#### **Appropriate RAF Interpretation**

The project should assist the development of RAF language such that Terroir members have rights to products of NRM investments.

#### **Accelerate Diffusion of Existing Practices**

The project should assist in accelerating the diffusion of existing and appropriate technologies.

## Suggested Next Steps

### Survey Trip

In order to develop a shared knowledge base about the perspectives for sustainable economic development through better management of NR, the Mission could use the NRMS Project to support a trip to sites in Burkina Faso, Mali and Niger where tenure policies, institutional reform, and Cooperative development have contributed to adoption of more sustainable NRM practices. This trip would be coordinated by specialists that have first-hand knowledge of these sites and should include personnel from MAE, MET, Plan and Paysans Affaires. The Mission may wish to engage someone like Saidou Sane to coordinate a "synthese" of the trip and the lessons learned.

### Assess the Potential for Groupement-Based NRM Enterprises

The Mission should consider supporting CLUSA in assessing the perspectives for strengthening the organizational capacity of *groupements*. In particular CLUSA could use their experience in Niger and Mali to develop options for developing NRM-based enterprises that would help diversify the cotton-based village economy and access to credit. In looking at ways to strengthen the capacity to conduct enterprises, CLUSA should also provide ideas on how to increase the capacity for *groupements* to negotiate for outside assistance on a partnership basis.

### Establish RAF Language for a CP

The Project should support an interpretation of the RAF that increases the incentives for Terroir members to invest in the management of NR. In this, the Mission may wish to capitalize on the LTC experience in Niger in working with the Mission and GON personnel to develop language that serves as a CP in the ASDG II Project.

## MATRIX OF ACTIONS AGAINST PERSONNEL FOR GTV COMPONENT

- A. **Element One: Strengthening Local Groupements**
  - 1. Selection of Sites
  - 2. Site Visits
  - 3. Zonage Within Terroir
  - 4. Implementation of the Terroir Management Plan
  - 5. Managing NRM Enterprises

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- B. Strengthening Security Over Products of Better Management**
  - 1. Develop Appropriate RAF Language
  - 2. Develop Tenure-Based Conditions Precedents
  
- C. Increasing Access to Knowledge About Appropriate Practices**
  - 1. Site Visits
  - 2. Farm Days
  - 3. Mass Media/Information Diffusion
  - 4. Special Training of *Groupements* Leaders
  - 5. Extension Training for CRPA and MET Agents
  - 6. Linking *Groupements* to Agencies Providing Assistance

## ANNEX C

### ODDS AND ENDS

#### Relevant Questions

1. Where have farmers, herders, and woodcutters adopted NRM practices to address the above constraints? Which constraints are poorly addressed?)
2. What are the conditions (policy, financial, institutional, etc.) that contributed to the adoption of the above practices?
3. What are the actions that contributed to establishment of the above conditions (on the part of the government, donor, or resource users)?

In this paper, the problems to address are natural resources management constraints to sustainable agricultural development within the context of village lands. Within this context GTV is management of a village land unit by a village-based group. In this paper, GTV is a concept and not necessarily tied to PNGTV. Under this concept, GTV has a variety of forms and a variety of impacts. In problem analysis, various GTV approaches will be assessed with respect to how it contributes to overcoming constraints to sustainable agricultural productivity through better management of natural resources.

This definition recognizes that there are at least two other resource bases that are not necessarily being addressed in this section:

- **Classified Forests:** These are lands within national forests over which the State has management responsibility.
- **Protected Lands (Domaine Protege):** These are lands not yet under management of a village-based group or the national government.

#### The Southwest: High Potential, High Risk

The southwest of Burkina Faso has been identified as an area of high potential with more favorable soils, vegetative cover, and rainfall than much of the rest of Burkina Faso. This resource base, the eradication of "oncho", and declining productivity elsewhere has contributed to a rapid increase in population and pressure on the natural resources base.

While agreeing that the SW has a relatively high potential for production, it needs to be recognized that it has an equally high potential for degradation. Once the vegetative cover is removed, the higher rainfall leads to rapid erosion, greater leaching of nutrients, and rapid breakdown of soil organic matter.

Unfortunately, once the resource base is degraded, restoration will be both expensive and time consuming. Actions taken now to stabilize production systems and to maintain the productive capacity of the NR base will be relatively cheap.

## ANNEX D

### ORGANIZATIONAL FRAMEWORK FOR PROBLEM ANALYSIS

#### **An Organizational Framework for Addressing Constraints to Sustainable Agricultural Development in Southwest Burkina Faso**

This approach is based on the following premises:

- There is much field-level knowledge and experience in addressing these constraints upon which to capitalize.
- But, this base is poorly organized, little appreciated, and little used in developing projects, programs and strategies.

In order to better organize questions and information about our collective experience in addressing natural resources constraints to sustainable development, a hierarchical framework that organizes changes along a continuum with respect to how they contribute to the following target: "Sustainable Agricultural Development Through Better Management of Natural Resources." The continuum has five levels of changes, each which contributes to changes in the next level. The levels, organized as questions aimed at achieving the target are as follow:

- **Level V: Target: Sustainable Agricultural Development Through Better Management of Natural Resources**
- **Level IV: What are the NR Constraints to Sustainable Development?**
- **Level III: What is the Array of Observed Farm-Level Practices that Address the above constraints in the short, medium and long-terms?**
- **Level II: What are Conditions Observed to Contribute to Adoption of Above Practices?**
- **Level I: What are Actions Observed to Contribute To Establishment of Above Conditions?**

#### **Additional Notes on the Framework**

1. **Level V: Sustainable Agricultural Development**
  - a. **Agricultural Development as used here means sustainable increases in food, wood, forage, and other products from management of soils, moisture, vegetative cover, germ plasm, and habitat.**

- b. **Target V is part of a larger context with the objective of sustainable economic development. Other targets that contribute to this objective include increased market efficiencies and technology advances.**

**2. Level IV: Natural Resource Constraints**

**The NR constraints to achieving the above target include short, medium, and long-term maintenance or improvements in soil fertility, soil/moisture conservation, vegetative cover for wood and forage, habitat, germ plasm quality, and pest control.**

**3. Level III: Practices Observed to Address the Above NR Constraints**

**Implicit in the approach is that an impact on the target will not occur if resource managers (farmers, herders, woodcutters, etc.) do not change their practices. The following is an illustrative list of practices addressing the constraints (in the attached matrix practices are organized in terms of having impacts in the short, medium and long-terms).**

**Soil Fertility: compost, protection of field trees, animal parking, mineral fertilizer, rotations, etc.**

**Soil and Moisture Conservation: Contour dikes, diguettes, gully plugs, water-check dams, mulching, windbreaks, living hedges, retention dams, etc.**

**Vegetative Cover: Natural forest management, maintenance of natural cover through stabilization, forage production (annuals and perennials), farmer-managed natural regeneration, etc.**

**4. Level II: Conditions Contributing to Adoption**

**Through analyses of over 40 case studies where improved practices had been adopted, the following programmable conditions were found to be common:**

- **Use rights to products of better management;**
- **Access to credit and markets;**
- **Access to knowledge;**
- **Availability of improved practices, etc.**

**5. Level I: Actions That Contributed to Establishment of Above Conditions**

**Observed in the same analyses were the following, programmable actions that contributed to the establishment of the above:**

- **Strengthening management capacity of cooperatives to negotiate usufruct and credit;**
- **Support of farmer to farmer visits;**

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- Support of research;
- Construction of farm to market roads;
- Reorientation of forestry agents from policing to extension;
- Training of extension agents.

## ANNEX IV

### NATURAL RESOURCES MANAGEMENT PROJECT GESTION DU TERROIR VILLAGEOIS COMPONENT

#### EARLY DRAFT

#### OBJECTIVE AND APPROACH

To assist members of Terroirs to better manage their natural resources base so that they achieve sustainable increases in income and productivity. The following principles guide the formulation of actions to achieve the objective:

- Build on Existing Experience and Knowledge.

On a regional basis, much progress has been made toward addressing the constraint to achieving the objective. The approach in this project aims to consolidate and capitalize upon those collective experiences. To the extent possible will be identified in terms of how they have been addressed.

- Shared Ownership of Concepts Guiding the Formulation of the Project.

In order to build a project upon a shared base of information, it is recommended that formulation process includes trips to locations where changes in techniques, policies, institutions and financial strategies have contributed to both economic and ecological improvements. These trips should be followed up with forums.

#### PROBLEMS

The problems to be addressed are organized hierarchically as follows:

- Level V: **Target:** Sustainable Agricultural Development Through Better Management of Natural Resources
- Level IV: What are the NR Constraints to the Above Target?
- Level III: What is the Array of Observed Farm-Level Practices that Address the above constraints in the short, medium and long-terms?
- Level II: What are Conditions Observed to Contribute to Adoption of Above Practices?
- Level I: What are Actions Observed to Contribute To Establishment of Above Conditions?

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## **CONSTRAINTS TO ACHIEVING SUSTAINABLE INCOME AND PRODUCTIVITY**

Achieving the target means sustainable increases in food, wood, forage, and other products from management of soils, moisture, vegetative cover, germ plasm, and habitat. Target V, obviously, is part of a larger context with the objective of sustainable economic development. Other targets that contribute to this objective include increased market efficiencies and technology advances.

### **NR Constraints**

The NR constraints to achieving the above target include short, medium, and long-term maintenance or improvements in the following:

- Soil fertility,
- Soil/moisture conservation,
- Forest and range resources,
- Germ plasm quality, and
- Pest control.

### **Addressing NR Constraints**

The objective can be achieved only if members of the terroir (farmers, herders, woodcutters, etc.) adopt appropriate practices that address each of the above NR constraints in the short, medium, and long-term.

### **Diffusing Better Practices**

Wider diffusion of better practices will occur where conditions exist that contribute to their adoption. These include the following:

- Use rights to products of better management;
- Access to credit and markets;
- Access to knowledge;
- Availability of improved practices, etc.

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**Level I: Actions That Contribute to Establishment of Above Conditions**

Actions on the part of the project that should contribute to the establishment of the above include the following:

- Support of appropriate implementation of the RAF in those terroirs supported by the project;
- Strengthening management capacity of cooperatives to negotiate usufruct and credit and to better manage NR-based enterprises;
- Support of farmer to farmer visits;
- Support of research to develop more effective practices;
- Reorientation of forestry agents from policing to extension;
- Training of extension agents.

**Targets**

1. Implement RAF in each of the Terroirs where the project participates such that the members of each terroir have the benefits of the good management of natural resources.
2. Strengthen the capacity of the *groupements* in each terroir — alphabetization
3. Accelerate Diffusion of practices that have shown promise in similar zones — the above two will help establish the conditions for diffusion. Other programs address other conditions.

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