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AN ASSESSMENT OF THE INTEGRATED RURAL  
DEVELOPMENT PROGRAM IN EASTERN  
UPPER VOLTA: 1974-1981

By

Kifle Negash

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## ABSTRACT

### AN ASSESSMENT OF THE INTEGRATED RURAL DEVELOPMENT PROGRAM IN EASTERN UPPER VOLTA: 1974-1981

By

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The main objectives of the study are to: a) assess the role of the individual EORD/IRDP service components in institution building; b) evaluate the impact of the EORD/IRDP on agricultural output and income; and c) examine the viability of the proposed Phase II EORD Food Production Program (1982-1987). The two major goals of the EORD/IRDP were to expand the Eastern ORD's administrative capacity and to increase agricultural production and rural income in the Eastern Region. The ultimate goal of the study is to outline and underscore the major lessons learned during the 1974-1981 experience in order to facilitate its incorporation in the future EORD food production program.

This study employed data from both primary and secondary sources. The two sources of primary data are the Base Line Farm Survey and the Inventory of Village Socio-Economic Characteristics of the Eastern Region, carried out during the 1978-79 and early 1980 seasons. Numerous secondary sources are also used--from official documents obtained from the Michigan State University Library and the

Sahel Documentation Center, as well as from published documents and reports based on EORD/IRDP field research.

The assessment of the achievements and limitations of the EORD/IRDP service components over the 1974-1981 period revealed that the credit program is the centerpiece of the various programs undertaken to facilitate food production, food security, and farm income in the Eastern Region. It assumes that credit will allow farmers to purchase donkeys, oxen and animal traction equipment in order to expand farm size and increase food production and farm incomes. Over the 1975/76 - 1980/81 period, a total of 4843 loans were extended to about 15.5 percent of the families in the Eastern Region. However, despite a major extension program to encourage increased agricultural output, the average loan repayment rate was only 32 percent over the 1976/77 - 1980/81 period.

During the 1974-1981 period the number of agricultural extension program agents grew from forty-seven to about 171. Nonetheless, the extension program lacks a systematic feedback mechanism for incorporating farmers' problems into the design of the research programs.

The monopoly of cereal purchase and sale responsibility bestowed upon the ORD since 1974 has not succeeded in facilitating proper operation of agricultural product marketing in the Eastern Region. Consequently, the ORD's



objective of accumulating revenue from sales activities so as to cover recurrent expenditures in other ORD program operations has not materialized.

The on-site Base Line Farm Survey and the Inventory of Village Socio-Economic Characteristics has generated a vast amount of data. Over the 1974-1981 period, over 70 project documents were produced, covering a wide range of topics: agricultural credit, farming systems, agricultural marketing, regional planning, small scale enterprises, etc.

As suggested by the various technical and economic indicators, the project performance during the 1974-1981 period also reflects a significant gap between the expected and the realized outcomes. Among the factors associated with the poor performance of the production program were the lack of biologically stable and economically profitable technical packages to increase the yields of the two staple foods, millet and sorghum.

The designers of the IFAD-led project have failed to incorporate the significant lessons of the 1974-1981 experience. For example, the IFAD proposal assumes that a package of improved practices exists for the region--contrary to the reality reflected by the indicators from the 1974-1981 experience.

One major policy conclusion drawn from the study underscores that the major thrust of the Phase II EORD Food

Production Program should be to generate a viable technical package suitable to the various agroclimatic zones found in the region. Suggested priorities for future research include investigation of the possibilities of, and necessary arrangements for, mobilizing savings in rural areas and the development of cost and return figures on the most promising rural small-scale enterprises.

DEDICATED TO:

Hagossa  
Meseret  
Lidet  
and  
Araya

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# LIST OF ACRONYMS

AFDB	African Development Bank
ANTRAC	Animal Traction
CCCE	Caisse Centrale de Coopération Economique (French Central Fund for Economic Cooperation)
CD	Community Development
CENATRIN	Centre National de Traitement de l'information (National Computer Center)
CFA	Communauté Financière Africaine
CILSS	Comité Permanent Interétats de Lutte Contre la Sécheresse dans le Sahel
CNCA	Caisse Nationale de Crédit Agricole (National Agricultural Credit Agency)
EORD	Eastern ORD
FAC	Fond d'Aide et de Coopération
FAO	Food and Agricultural Organization
FED	Fonds Européen pour le développement
IFAD	International Fund for Agricultural Development
IRD	Integrated Rural Development
MDR	Ministère du Développement Rural
MEU	Monitoring and Evaluation Unit
MSU	Michigan State University
OECD	Organization for Economic Cooperation and Development
OFNACER	Office National des Céréales (National Cereal Agency)
ORD	Organisme Regional de Développement (Regional Development Organization)
PID	Project Identification Document
PP	Project Paper
SWID	Strengthening Women's Role in Development
UNDP	United Nations Development Program
USAID	United States Agency for International Development

## CHAPTER I

### INTRODUCTION

#### 1. Background Information

Upper Volta is one of the eight Sahelian<sup>1</sup> countries<sup>2</sup> where the food supply situation worsened during the 1968-1974 drought. During this period, the country lost about 30 percent of its livestock population (Shear, 1977), and cereal food production also declined substantially. According to one estimate, for instance, sorghum production, which was averaging 714 thousand tons a year over the 1964-1967 period, declined to 515 thousand tons a year during the 1967-1972 period (FAO, 1977). Also, a USAID estimate indicates that the per capita food production index for Upper Volta declined from 76 in 1970 to 70, 66, and 58 in the 1971, 1972, and 1973 periods, respectively (Christensen, 1981). This situation aggravated the state of malnutrition, which in turn increased the vulnerability of the Voltaic population to sickness and disease.

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<sup>1</sup>The term Sahel is an Arabic word for shore, in this case meaning "edge of the desert".

<sup>2</sup>The eight Sahelian countries are: Cape Verde, Chad, the Gambia, Mali, Mauritania, Niger, Seregal, and Upper Volta.

Even prior to the advent of the 1968 drought, domestic and external efforts and financial resources combined to alleviate the food crisis. The government of Upper Volta, like that of many other Sahelian countries, has labelled agricultural development as the centerpiece of its rural development program. The domestic effort to promote agricultural development was spearheaded through the leadership of the Office of Regional Development Organizations (ORDs). The first ORD was created in 1966 and was headquartered in Ouagadougou. Subsequently 10 more ORDs were established in the country. The Eastern ORD was initiated in 1968 and was officially established in 1974, about nine years after the creation of the first ORD.

Basically, an ORD is responsible for rural development in its respective area. Although the core of each ORD is the extension service, it is intended as a means to offer a range of services--such as marketing, veterinary care, roads, etc.--required for a broadly-based approach to development. This approach was a departure from the former one-commodity or one-technical-package programs (promoting one crop, such as rice, cotton, etc.) that many francophone West African countries pursued in the 1960s. In 1975, the ORDs were mandated to create regional development plans as agencies of integrated development, including activities outside of agriculture.

The implicit but significant rationale in the inception and establishment of the ORDs was the desire to promote



decentralization and coordinated administration of development activities at the regional and local level. Two significant benefits were expected to result from decentralization. First, decentralization enables decisionmakers to formulate relevant policies in catering to the well-being of people in smaller regions by taking into consideration regional differentiation of resources and preferences as a basis for responding to perceived local problems. Secondly, the decentralization process was also anticipated to encourage greater local participation in determining the scope of ORD activity and the beneficiaries of the program. The positive attributes of greater local participation were to facilitate effective mobilization of local resources for both regional and national purposes. The intent of the administrative coordination was to provide a horizontal integration of administrative and technical activities at the regional level rather than the prevailing overcentralized vertical organization.

During the early stages of the drought, each individual Sahelian country was soliciting donors for relief assistance. In 1973, however, these countries formed a joint Committee now commonly known as CILSS<sup>1</sup>. Although the initial CILSS objective was geared toward donor resource solicitation for temporary relief purposes, its focus has evolved

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<sup>1</sup>CILSS is a French acronym for the Interstate Committee for Drought Control in the Sahel.

over time to be a mechanism for coordinating the Sahelian activity toward regional long-term development. Currently, the CILSS secretariat is headquartered in Ouagadougou, the capital of Upper Volta.

Later, the principal donors, in consultation with the Development Assistance Committee of the Organization for Economic Co-operation and Development (OECD), succeeded in creating a body known as the "Club du Sahel". It comprised as members the eight Sahelian states, plus 12 bilateral and eight multilateral donor organizations. The two primary goals identified by the club were (a) achievement of food self-sufficiency and (b) eventual self-sustaining economic development.

With regard to the food self-sufficiency goal, for instance, the effort is targeted toward the region as a whole, rather than intending to achieve absolute sufficiency in food production at the national level. Even though countries endowed with comparative advantages are capable of attaining the objective, it is recognized that others are incapable of attaining the same without a high cost in domestic resources. It is further assumed that intra-regional trade will balance out the food deficit of individual countries, provided that some undue hindrances are cleared to facilitate smooth inter-regional flow of goods and services.

While the weather-induced Sahelian crisis was progressing, the community of scholars and institutions was

echoing its growing concern over the declining economic status of the poor in many of the developing countries. In an article entitled "The Meaning of Development", Dudley Sears, 1970, stressed, among other things, the need for a fundamental re-thinking of planning. He pointed out that,

"The medium term (e.g., five-year) plans now published need to be reconstructed to form steps towards long-term targets for the reduction of poverty, unemployment and inequality, instead of being means of achieving national income targets."

In their book Development Reconsidered, Owens and Shaw, 1972, isolated the economic fallacies of past development assistance and many capital-intensive investment programs while indicating the benefits of adopting labor-intensive policies. In an African Rural Employment Paper, Byerlee and Eicher, 1972, presented detailed analysis of rural employment issues with pertinent empirical evidence from Africa, above all other things assessing possibilities for synchronizing growth, employment and income distribution objectives. The most often quoted statement on poverty by Mr. McNamara was also aired during this period. Mr. McNamara said that:

"Growth is not equitably reaching the poor. And the poor are not significantly contributing to growth. Without rapid progress in smallholder agriculture throughout the developing world, there is little hope either of achieving long-term stable economic growth or significantly reducing the level of absolute poverty . . . The fact is that very little has been done over the past two decades specifically designed to increase the productivity of subsistence agriculture . . . the most difficult problem in fashioning a strategy for the world-wide development of smallholder agriculture is the design of an appropriate organizational structure . . . new forms of rural

institutions and organizations that will give much attention to promoting the inherent potential and productivity of the poor." (McNamara, 1973).

As the concern for the poorest 40 percent gained increased publicity in the international press, bilateral and multilateral assistance continued flowing to the drought- and famine-stricken Sahelian countries. In addition to the short-term relief aid, there was also long-term assistance that led to the initiation and establishment of several broad (integrated) rural development projects. These projects emanated from various sectors, such as agriculture, rural water supply, livestock, fisheries, forestry, transportation, education, and health, deemed to have priority in the strategy of Sahelian development.

In Upper Volta, the ORD structure served as a mechanism for channeling external assistance aimed at improving agricultural productivity and rural welfare. For instance, substantial assistance funds have been supplied by FAC, FED, CID, etc., to various ORDs as far back as 1966 (Plan quinquennal, 1972-76). As one of its first drought recovery projects in the Sahel, USAID financed a \$4.4 million<sup>1</sup> integrated rural development program in the Eastern ORD. Additional funds were also contributed by numerous donors, including UNDP. The USAID financing was intended to provide appropriate technological packages to small farmers and herders. Its components were envisaged to include programs

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<sup>1</sup>The budget in Appendix 6 reflects the budget as of late 1979.

for: strengthening the region's extension and marketing activities, providing facilities, improving wells water control, farm-to-market roads and range management, and promoting increased food production and better diets (Cohen, 1979).

Cognizant of the additional resource requirement for pursuing further development activities, the donor members of the Club du Sahel agreed in their 1977 meeting to contribute \$10 billion for financing varied programs within the framework of food self-sufficiency and self-sustaining development, to be achieved in the year 2000 (AID, 1978).

Like many of the drought-stricken countries, Upper Volta has attempted to increase the availability of the food supply by increasing food imports dramatically. The value of food imports rose from 3 billion CFA<sup>1</sup> in 1972 to over 8 billion CFA in 1974. Quantitatively, the cereal imports increased from 25 thousand tons to 94 thousand tons in 1974 (BCAD, 1977).

In spite of the increased resource flow and acceleration of foresighted project activities, as well as the increase in imports, the prevailing food availability record is not encouraging either in Upper Volta or in the other Sahelian countries. According to current statistics (Berg, 1981), the average annual growth rate of agriculture in Upper Volta was negative (-3.3%) for the 1970-1979 period.

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<sup>1</sup>Using the 1977 rate of \$1 US - 220 CFA.

In comparison, the average annual growth rate of agriculture for the Sahel in the 1970-1979 period was 0.28%. In the same period, the food production index for Upper Volta declined by about 13 percent, from 76 in 1970 to 67 in 1979. The declining per-capita food production in Upper Volta was accompanied by inadequate calorie intake. According to a 1977 study, the intake represented only 79 percent of the nutritional requirement (Christensen, 1981).

Several studies have been completed to date assessing the problems and prospects of food production in different Sahelian countries, including Upper Volta. Lele (1975) and Dupriez (1978)<sup>1</sup> have independently analysed many of the broad-based (integrated rural development) projects, basically searching for common factors contributing to their success and/or failure. Each of these authors underscored numerous location-specific constraints, among which were: distortion of markets at all levels; low level of human capital formation; poor program design and implementation, etc.

Gray and Martens, 1980, have also presented a micro- and macro-level analysis of recurrent cost problems of development programs in the countries of the Sahel. Their report observes that "mention of the recurrent cost problem inevitably evokes visions of dilapidated schools, hospitals

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<sup>1</sup>Lele's analysis includes a project from Mali, and Dupriez's analysis includes cases from Niger, Chad, and Upper Volta.

without drugs, abandoned irrigation ditches, impassable roads, new tractors immobilized in the field, etc.", illustrating the inability of host countries to cover continuing costs.

Christensen et al., 1981, Berg et al., 1981, and Eicher and Baker, 1982, have also very well documented the magnitude of the problem on a much broader framework, taking into account the total area of sub-Saharan Africa.<sup>1</sup>

Christensen et al. characterized the whole area as the only region of the world where the per capita food production declined over the last 20 years.

The Berg report states that agriculture in Africa is approaching a dangerous state. Over the last 20 years, export crop production has stagnated, and food production has declined. Africa's share of the world market for agricultural products has slumped while food imports have soared. The income for many rural producers has steadily dropped. He says, "It is no exaggeration to talk of crisis," and warns, "We are faced with an urgent need to understand what has gone wrong and what must be done to assure a better future for Africa's people."

Eicher and Baker have just completed a critical and very instructive assessment of past and current agricultural research in sub-Saharan Africa, including research on migration, employment, income distribution, rural non-farm

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<sup>1</sup>Sub-Saharan Africa contains about 41 African countries, including the Sahel.

employment, markets, storage, processing, consumption and trade. Among their various contributions, one finds empirical evidence to challenge the fallacious assumption that poor African farmers are passive peasants; their data vividly illustrate that the peasants are ready to respond for appropriate economic incentives and to assume the associated risks, within the limits of their resources, in order to improve the welfare of their families. With respect to the future, Eicher and Baker suggest that research priorities for the 1980s be based on smallholder farmers, herders, and small-scale entrepreneurs.

Most of these documents, while furnishing data on the overall problems of rural development in Africa, repeatedly underscore the need for carrying out a space- and/or program-specific study on a continuous basis in order that lessons can be drawn to improve the performance of current and future rural development programs.

## 2. Need for the Study

Two major reasons can justify the study. First, the EORD/IRDP represents one of the many IRDPs that were implemented during the earlier period while the popularity of the IRDP approach was still on the rise. Towards the latter part of the 1970s, however, its appeal had already started declining, as an increasing number of scholars continued to point out limitations in the IRD approach similar to those first ascribed to the earlier community development program.



For instance, Holdcroft, 1978, stresses that if many of the new IRDP programs employ the same organizational methods as CD (i.e., government change agents, aided self-help projects, and collaboration with elitist leaders), the results achieved by IRD will probably mirror the CD experience. Nonetheless, IRD has meant different things to different people, and hence the literature presents varied meanings and connotations to the integrated rural development concept. For instance, to Kotter, 1973, IRD means rural transformation, and hence the application of a package program including change not only of method of production and of economic institutions, but of social and political infrastructure as well, and transformation of human relationships and opportunities. To Clapp, 1977, IRD efforts are programs in the rural area, with a local focus; they are multi-sectoral in concept; they are potentially self-sustaining; and there is an element of coordination among the implementing agents for the projects. Ahmad, 1975, also asserts that the term integrated is a concept of administration: the planned supply of simultaneous services that enables a rural development program to become operational. According to a group of FAO experts, the term integration alone has several meanings:

- integration of the rural poor into the mainstream of development;
- a strategy taking into account the interdependence of political, technical, economic, and socio-

cultural elements, as well as the urban sector;

- a poverty-oriented approach, aimed at releasing the productive potential of the poor; etc.

Idachaba, 1980, also distinguishes a five-point analytical framework for integrated rural development:

- a. integrated supply of farm inputs and marketing facilities;
- b. equitable supply of farm inputs and marketing facilities;
- c. integrated farm and rural non-farm production and marketing;
- d. integrated supply of farm and rural non-farm inputs, markets, and social amenities;
- e. integrated rural development and the political process.

In view of this definitional ambiguity, there is a need to assess IRD projects and to isolate the lessons learned in different contexts. Secondly, the first phase of the EORD/IRDP initiated in 1974 was completed at the end of June, 1981. Currently, the EORD is prepared to launch the next phase of its food production program at a cost of over \$30 million in contributions from different sources. Various studies have been conducted on specific aspects of the EORD program. In this study, however, the attempt will be made to assess the overall performance of the EORD/IRDP in institution building and stimulating agricultural production

in the area. The ultimate purpose is to outline lessons learned during the 1974-1981 experience.

This assessment will generate information which can be utilized at different levels. It can assist EORD decisionmakers in improving future project performance. The lessons to be derived are equally relevant for both high-level Voltaic government, for USAID, as well as for other donors in designing future programs that have the potential to effectively stimulate performance in expanding agricultural output.

### 3. Scope of the Study

The EORD, also known as the Eastern Department, covers an area of 50,000 square kms., and according to most recent estimates contains about 442,559 inhabitants. The EORD is mandated to plan and implement rural development programs for the whole region. The programs of EORD are financed by contributions from various donors. Aside from the USAID, for instance, UNDP and the FAO have collaborated in financing different activities, such as lowland water control, delivery of inputs including animal traction equipment, vegetable production, and support of personnel. Nellis et al., 1982, reports that these activities were implemented in the Fada sector, costing UNDP and FAO \$3,207,000 since 1975. The EORD has also received other contributions from CCCE, CTS, the World Bank, FENU, etc.

However, because of the scattered nature and the lack of adequate data on the other funding arrangements, the current study focuses only on the EORD/USAID/IRDP. Aside from exploring the institution-building effect of the IRDP, the major focus of the current assessment is to determine the impact of the IRDP on agricultural production and income.

The initial objectives of the EORD/IRDP are presented in the logical framework prepared by the design team Stacy et al. in 1974. This framework is attached as Appendix 1. In 1978, a mid-term evaluation of the USAID/IRDP was conducted by a team--Poulan et al., 1978. The team found the indicators in the original project paper unrealistic, and proposed an alternative set of indicators based on output expectation of the project being implemented. The revised logical framework, which is also the frame of reference for the present study, is attached as Appendix 2.

#### 4. Objectives of the Study

The six principal objectives of the study are to:

- a. provide a descriptive analysis of agriculture in Upper Volta and the Eastern Region;
- b. identify and analyze the methodological issues involved in evaluating integrated rural development schemes;
- c. assess the role of the individual EORD/IRDP components in institution building;

- d. evaluate the impact of the EORD/IRDP on agricultural output, income, and equity objectives;
- e. examine the viability of the proposed Phase II EORD food production program (1982-1987); and
- f. draw lessons to be learned from the 1974-1981 experience and suggest alternative policy options for improving future program design and implementation.

### 5. Sources of Data

The two primary sources of data for the present study are the Base Line Farm Survey and the Inventory of Village Socio-Economic Characteristics of the Eastern Region. These surveys were carried out in 1978-1979 and early 1980, respectively, by Michigan State University teams in collaboration with EORD staff. During the 1980-1981 production period, representative bas-fonds areas were also surveyed to understand the economics of bas-fonds production in the Eastern Region.

Based on data from these surveys, over 70 reports and three dissertations have been produced, covering a wide range of topics and different aspects of the integrated rural development components. Four more dissertations, including the current study, are to be completed in the very near future. The farm level data and the various project reports will be used in the evaluation of the impact of the EORD/IRDP on agricultural output and income. However, there

is no sufficient primary data base for assessing the institution-building effect of the IRDP. Therefore, secondary data will be used, from published research reports and official documents obtainable in the MSU Library and the Sahel Documentation Center, in assessing the pattern of success and failure of the institution-building effort of the IRDP service components.

#### 6. Organization of the Study

There are seven chapters in this study. Chapter II outlines and discusses the major methodological issues that are encountered in evaluating agriculture-oriented rural development schemes. Implications for evaluating institution building and the impact on agricultural production of the EORD/IRDP are examined. Chapter III provides background information. It will present a brief overview of the physical, economic and institutional setting Upper Volta, focusing on its development objectives, development priorities, administrative arrangements, linkages between planning and policy formation, financing and project management, cultural and physical factors. The latter portion of the chapter will present a descriptive analysis of agriculture in the Eastern Region, followed by a brief discussion of the EORD program. Chapter IV is concerned with the achievements and limitations of the EORD/IRDP service components in institution building. The assessment is focused on the agricultural credit, agricultural extension, agricultural

marketing, and socio-economic studies components. Chapter V evaluates the effects of the IRDP on output and income. In Chapter VI, an overview of the Phase II EORD food production program, lessons from the 1974-1981 experience, and the implications of Phase II design are given. Finally, Chapter VII presents a concluding summary and recommendations.

## CHAPTER II

### EVALUATION OF INTEGRATED RURAL DEVELOPMENT SCHEMES: MAJOR METHODOLOGICAL ISSUES

#### 1. Introduction

The expansion of integrated rural development schemes in many African countries has led to a requirement of donors to evaluate the results of IRDP over time.<sup>1</sup> However, as Johnston and Clark, 1982, point out, debates over development strategies have tended to flit from fad to fad rather than building a cumulative body of fact and informed consensus. They conclude that the development community has failed to learn from experience, repeating the same mistakes over and over again.

The purpose of this chapter is to discuss the major methodological issues that are involved in evaluating integrated rural development schemes.<sup>2</sup> The chapter is organized into three sections. The first section describes process and impact evaluation--the two major types of evaluation for an

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<sup>1</sup>Major studies of West African focus include: Dupriez, 1978; Lele, 1975 and 1979; Odell, 1978; and Okador, 1978.

<sup>2</sup>The broad issues in evaluation research are adequately documented in the following sources: Carruthers et al., 1977; Cernea and Tepping, 1977; Danel, 1979; Dominique, 1982; Gittinger, 1982; Korten, 1980; Mishan, 1982; Nunnally et al., 1975; Rossi et al., 1979; Rutman, 1977; and Weiss, 1972.



agricultural production based integrated rural development project. The second section discusses the major methodological issues related to IRD program conceptualization, project criteria selection, measurement and valuation. The third section explores the implications for evaluating the EORD/IRDP.

## 2. Types of Evaluation

There are diverse viewpoints about the appropriate types of evaluation. For instance, Clayton, 1981, discusses evaluation as part of a Monitoring and Evaluation framework. Monitoring is defined as a process of measuring, recording, collecting, processing and communicating information to assist project management decision making. In relation to agricultural and rural projects, this process focuses on their operation, performance and impact.<sup>1</sup> On the other hand, evaluation involves the comparison of actual project operation, performance, and impact with those originally specified or planned. Evaluation can also attempt to determine causal relationships between project inputs/activities and outputs and the influence of external constraint/support factors on project performance and outputs.

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<sup>1</sup>Project operation covers the many tasks performed regularly or intermittently and required for the proper functioning of a project. Project performance refers to the degree of achievement of project targets. Project impact deals with the effects of project operation and performance on rural people. For further details see Clayton, 1981.

Similarly, Slade, 1981, states that Monitoring is the timely gathering of information on project input, outputs and complementary activities that record the progress of a project towards the achievement of its objectives. It requires a simple, cheap and easily operated system based on the careful definition of the parameters to be observed. Slade further observes that, evaluation is primarily the comparison of actual project effects and impacts against established plans and can be both on-going or ex-post. In general it operates within a much longer time frame than monitoring and requires more specialist skills.

Based on the findings in much of the evaluation literature, the present study delineates process and impact as two major types of project evaluation. These two types of evaluation, which are aimed at achieving different purposes, are known by varied names. For instance, some evaluators label process evaluation as formative evaluation, implementation assessment, farmer assessment, monitoring, ongoing evaluation, and/or input evaluation. On the other hand, impact evaluation is often identified as summative, ex-post, effect and/or output evaluation.<sup>1</sup>

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<sup>1</sup>For variation in terminology see: Barclay, 1980; Cernia, 1979; Freemant, 1977; Korten, 1980; Macy and Marvis, 1982; Morris and Brandel, 1982; Rakodi, 1982; and Wolfson, 1981.

## 2.1. Process Evaluation

Process evaluation refers mainly to those types of evaluations undertaken during the developmental phase of a program. Process evaluation aims at attaining at least three specific purposes. First, it assesses the availability of administrative capacity to implement a program. At the macro-level, it assesses existing capability for policy analysis, resource allocation, project selection and management. At a micro-level, it examines the extent to which basic implementation tasks such as policy interpretation, finalizing design, recruitment of staff, specifying operating procedures, readying facilities, delineating action sites, inter- and intra-agency coordination, etc., are undertaken according to stated guidelines and specifications in the project program design. Second, it attempts to ascertain whether or not the program is approaching the appropriate target population or target area. The third and most significant purpose of process evaluation, particularly in relation to agricultural projects, is farmer assessment.

Farmer assessment, also referred to as "evaluation of technology" or "monitoring of farmers' experiences with technology," has been described by Dillon, as follows:

"Once research is underway and results begin to come to hand, evaluation can begin. Full evaluation is not possible until farmer utilization or trials of the new technology provide real-world data. Until then, only relatively soft data will be available. But this should not deter the start of evaluation. Indeed, the early evaluation of research station and field trial data will be very important to extension design

activities. Necessarily, ex-post evaluation activities will duplicate much of the ex-ante activity. Data on research and farmer results will need to be collected and appraised, leading in turn to further research guidance. In this sense, particularly when an ongoing program of research is underway, ex-ante and ex-post guideline activities meld together in a continuing cyclical process." (Dillon, 1979, p. 176)

Similarly, Anderson and Hardaker define an important role for the evaluation of technology:

"Evaluation can be thought of as an on-going process of monitoring seemingly useful changes in technology. It can and should take place in the various contexts discussed below and it provides information for groups--most immediately to the developers and purveyors of new technology, then to the various communicators of information." (Anderson and Hardaker, 1979, p. 13)

Hildebrand, 1978, also writes that farmer assessment of new technology is included in the process of technology generation because

". . . small farmers will, and do accept change when the available resource base changes or new and appropriate technology becomes known. Otherwise, they could not be efficiently adjusted to alternatives they now have. But it is important to understand that this efficient adjustment is in terms of the farmers' own understanding and interpretation of his situation, and it is not necessarily efficient according to the perceptions of well meaning, but incompletely-informed third persons." (Hildebrand, 1978, p. 31)

Harrington, 1981, notes that: the above authors are all referring to more or less the same concept, though the terms used vary. He then defines:

"Farmer assessment of recommended technology: An interactive process whereby the collection and analysis of information from farmers, concerning the way in which they employ a recommended technology as well as the advantages they perceive in it and their decision regarding the wisdom of employing it, is used in

subsequent decision-making on research and extension priorities, and on policies affecting farmers' adoption decisions." (Harrington, 1981, p. 10)

By assessing the technology in question, farmers can provide three kinds of information to researchers: (1) the exact fashion in which they employ the technology, (2) the advantages and disadvantages of using the technology, and (3) their decision regarding use or non-use of the technology, given these advantages and disadvantages (Harrington, 1981).

Ultimately, process evaluation aims at enhancing coordination, permitting problems to be diagnosed at an early stage, and putting suggestions forward to eliminate bottlenecks in carrying out project management duties.

In recent years, process evaluation of current administrative capacity and augmenting administrative capability as well as farmer assessment, have gained significant attention in the development literature.<sup>1</sup>

The growing significance of process evaluation results partly from the persistent failure of numerous development projects in many countries, particularly as reflected by the inability of the projects to insure continuation of benefits and growth after the expiration of initial funding arrangements. In most countries, the projects are initially

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<sup>1</sup>See Eicher, 1982; Hondale, 1980; Korten, 1980; Johnson and Clark, 1982; Lele, 1979; Murelius, 1981; Wildavsky, 1978; and Wolfson, 1981.

funded through resources generated from external sources, possibly, with a small contribution from the central government's budget in the respective countries (see Martens and Clive, 1980).

In discussing the growing significance of process evaluation, Clayton and Pétry observe that:

"Although many rural development projects have produced favorable results, others have proved disappointing. Ex-post evaluations have often brought to light unforeseen operational difficulties or negative effects of well-performed activities too late for corrective action to be taken. The need for continuous evaluation and close monitoring of agricultural and rural development projects is therefore felt more and more strongly by national governments, as well as by international funding agencies." (Clayton and Pétry, 1981, p. iii)

Underlying the emphasis on process evaluation is the desire to promote the formation of human capital and the need to adopt a strategy which gives priority to institution building for rural development.

Above all other things, the learning effect from the feedback of a continuous evaluation of experiences is expected to promote the attainment of self-sustaining rural development. For instance, Lele, 1979, stresses that making the process of rural development self-sustaining<sup>1</sup> requires the development of the appropriate skills and project implementing capacity at the local, regional, and national levels

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<sup>1</sup>"Self-sustaining" here refers to "involving, as distinct from simply reaching, the subsistence populations through development programs."

to ensure the effective use of existing resources and to foster mobilization of additional financial and human resources for continued development of the subsistence rural sector. Similarly, Johnson and Clark, 1982, underscore two major failures of contemporary development organization. First, they indicate that the organization has failed to increase the ability of the rural poor to solve their problems. Secondly, they stress the inability of the organization to sustain a long-term perspective in its problem-solving activities. On the same line, Eicher, 1982, raises numerous relevant issues in reference to long-term planning, aid coordination, food policy strategy, technology transfer, and private enterprises, emphasizing the need to correct the apparent weaknesses of the many crash food production and integrated rural development projects prevalent in numerous African countries.

Two points are worth noting at this juncture. First, the increased emphasis on development of human capital formation has given rise to increased specification of training and research components in agricultural projects. The intangible benefits emanating from such components have given rise to a host of methodological problems of evaluation, particularly in valuating the benefits in monetary terms.<sup>1</sup> Secondly, in order to generate timely and relevant

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<sup>1</sup>Intangible benefit valuation issues are taken up with the input and output valuation issues in a later section of this chapter.

information that is capable of resolving potential and prevailing project constraints, it will be essential to handle certain problems emerging from various aspects of evaluation. Deboech and Ng, 1980, observe that the organizational aspect<sup>1</sup> of evaluation contains numerous items of significance deserving careful scrutiny during the planning phase of process evaluation. It pertains to such points as in-house vs. outside evaluation arrangements. According to much of the evaluation literature, for instance, process evaluation is considered to be an in-house activity and an integral part of the management information system. Data could be generated by using either regular or periodic reporting practices on pertinent problems or particular issues of concern. Other organizational questions are likely to emerge in specifying the role of consultants, staffing, and additional resource requirements of evaluation.

## 2.2. Impact Evaluation

Impact evaluation usually refers to the final evaluation of a program, and is concerned with gauging the extent to which a program achieves its intended objectives. It can be both on-going and ex-post. However, since the on-going

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<sup>1</sup>The two other aspects of evaluation identified by the authors are managerial and technical aspects: The managerial aspect refers to issues related to establishing rationales for undertaking evaluation and on the expected outcome of an evaluation. The technical aspect of evaluation refers to issues regarding data collection, processing, and presentation of results.



aspect of impact evaluation belongs in the process evaluation category, the presentation in this section focuses only on the ex-post impact evaluation.

There are two main purposes of an ex-post impact evaluation. First, it provides data on the project itself regarding whether it has been a success or not; secondly, it provides information to the planning process based on lessons gained from the experience. In the aggregate, the information helps in making decisions regarding the programs future--its replication and/or dissemination.

An integrated rural development program with an agricultural production oriented objective focuses on expanding output. The increase in total production results either from the expanded use of resource inputs such as physical inputs, capital, labor, etc., and/or from improved input productivity emanating from such efforts as increased research, training, and effective management of basic tasks. The most significant impacts from an agricultural production oriented integrated rural development program include: physical impact, economic impact, social impact, and environmental impact.

The physical impact emanates from the increase in crop and/or animal production resulting from project intervention. Yield effect is a commonly-used indicator for gauging project performance in physical terms. Other physical effects of projects are also specified in appropriate

physical units, such as kilometers of roads, canals built, number of hectares planted, number of farmers visited, number of animals vaccinated, quantity of fertilizer distributed, loans allocated, food aid distributed, etc., depending on the type and nature of intervention components.

The economic impact refers to the expected returns, valued in monetary terms, that accrue to the target beneficiaries. Household income is the most frequently used economic impact indicator at the farm level. The income component may include revenue generated from crop production, livestock production and all other off-farm sources.

The social analysis is concerned with gauging a range of issues in relation to employment, income distribution and specific issues such as the extent of tenant eviction or conflict arising among farmers due to such causes as unclear land titles, anticipated and/or unanticipated effects of the project on the role of women or age groups, effects on the pattern of settlement, etc.

Similarly, the environmental impact assessment focuses on considerations such as the preservation of ecosystems, primarily in reference to soil, forest, or range resources and human health (see Lee, 1982, for ecological considerations in designing agricultural projects for tropical regions).

### 3. Major Methodological Issues

The discussion in this section concentrates on three broad problem areas. The first discusses definitional problems

in conceptualizing integrated rural development programs followed by a brief discussion of the problems associated with identification of performance criteria. The final section treats subsequent issues of measurement and valuation of inputs and outputs from both financial and economic analysis perspectives.

### 3.1. Definitional Problems

#### 3.1.1. IRD Program Definition

As most evaluation literature suggests, the first stage in any evaluation research entails assessing the evaluability of the program.<sup>1</sup> This task requires assuring the existence of a clearly-defined goal and effect, and a stated rationale linking the stated goal to the program and its effects. An attempt to accomplish this task with respect to IRD schemes gets to be too complicated, mainly because the strategy of integrated rural development schemes assumes many and varied definitions.<sup>2</sup> Cognizant of the prevailing conceptual ambiguity, Sweet, 1978, states: "My difficulty with the term 'integrated rural development' is that it has become a guise for almost any effort directed at a rural area. I have heard many definitions, but few appear to represent viable development approaches." Steedman, 1977, also commented that, ". . . the integrated rural development

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<sup>1</sup>See for instance Rossi et al., 1979.

<sup>2</sup>See Ahmad, 1975; Clap, 1979; FAO, 1978; Kotter, 1973.

concept suffers from the weakness of overreaching itself . . . the dilemma of IRD is that in trying to do everything it may end up doing nothing." Ruttan, 1975, dismisses IRD by saying that it is "an ideology in search of a methodology or a technology." In their recent book, Johnson and Clark, 1982, also attest that, though the concept of IRD is distinguished by its focus on rural rather than agricultural development as well as by its emphasis on integration, it has not been possible to discover an operational definition of integrated rural development. They warn their readers that their three-pronged strategy--which visualizes the strategic advantages of pursuing production consumption, and organizational programs simultaneously, with explicit recognition of their relationship--should not be misunderstood as an argument for tactical integration of all development activities.

Subsequently, any systematic examination of IRDP activities to specify goals and effects is likely to reflect some of the following problems:

- Fuzziness--ambiguous definitions attempting to satisfy a variety of interests in order to insure broad-based support for the project, etc.
- Disagreement among project staff and/or policy makers on the goals of the project and priorities among stated goals.
- Differentiation between goals which can be achieved

during the course of implementation and those which are of a more long-term nature.

In view of such prevailing ambiguities, the evaluation task entails obtaining a clear goal statement at the initial stage of the evaluation. Once the relevant goal is clearly specified, the remaining challenge in the definitional domain continues to be the reduction of the statement of desired state into evaluable operational objectives. The current study anticipates tackling this task by the focusing on agricultural production objectives of the EORD/IRDP.

### 3.1.2. The Concept of Appropriate Agricultural Technology

The growing interest in the area of appropriate agricultural technology and technological change in LDCs seems to have stemmed from the persistent food shortage and malnutrition that most developing countries are experiencing. Since development programs emphasizing increased use of traditional input have contributed only modestly to agricultural output gains, economists have increasingly been favoring technological change as the major "engine of growth." (Peterson and Hayami, 1972)

The expressions "technological change" and "technical change" are interchangeably used to denote the same phenomenon. Schmookler, 1966, however, preferred to use the term technological change to denote the act of producing new knowledge, and technical change to denote the incorporation of this new knowledge in the production process of firms.

Technological change is usually defined in terms of either a production function or a productivity index.

Ruttan, 1956, defines it as a change in the parameters of the production function or a creation of a new production function. Thus, technological progress can be viewed as an upward shift in the production function. In a productivity index context, Ruttan defines technological change as the production of a greater output with a given quantity of conventional inputs, or an increase in output per unit of input. Tecle, 1973, stresses that both contexts of the definition are consistent with each other because a productivity index implies the existence of a production function, and vice versa.

In order to have changes in output per unit of input, or shifts in a production function, there should be changes in the quality of inputs. Thus, observing changes in productivity implies that some inputs have changed in quality (or new inputs have been used) and these quality changes are not reflected in the total input measure. Tolley, 1969, points out two approaches to the analysis of technological change, the "no-quality change" approach which employs input measures that are not adjusted for quality changes, and the "explain everything" approach which allows adjustments to be made when dealing with productivity. Peterson and Hayami, 1972, make the point that it is possible to measure only conventional inputs (excluding input quality adjustments), and then explain the residual by measuring the

contribution of any new, non-conventional inputs or making quality adjustment in the conventional inputs.

However, the literature on technological change presents varied approaches regarding the evolution of appropriate technology in a given setting. For instance, McInerney argues that:

"It is folly to isolate only the technical aspects of production:--Many unhappy experiences in the last two decades with the transfer of available highly productive farm technology to developing agricultures have made it abundantly clear that technology change does not merely modify the productive activities of a society. Rather, it triggers an array of adjustment throughout the entire socio-economic system. . . Since technology is never exclusively a production phenomenon, then neither selection of the most appropriate technology for a given situation nor the prediction of its consequences can be treated solely within the restrictions of a technical framework. . . The necessity for extended examination in the design phase of all facets of innovation projects because the ultimate aim is not simply to transfer technology, but to make technological change an internally induced phenomenon." (McInerney, 1978, p. 32)

and concludes that:

"What is 'appropriate' must obviously grow out of the characteristics of a particular development situation, and cannot be defined in general and universal terms." (McInerney, 1978, p. 43)

As an alternative to McInerney's holistic views Mickelwait et al., 1979, advocate the process approach, which is also the focus of this particular study. At the outset, they distinguish between process and holistic approaches based on the views of each approach on uncertainty:

- A fundamental tenet of the process approach--(is) that it is impossible to determine in advance all project activities that may be appropriate.

- The conventional approach assumes that solutions to the problems of the rural poor are known and that projects are vehicles for applying them.
- The emphasis of the conventional approach is on upfront planning and highly specific and detailed mapping and schedules prior to the beginning of implementation.

### 3.1.3. Farmer Assessment of Appropriate Technology

In the process approach, farmer assessment of new technology is an indispensable mechanism for gathering information from farmers regarding their reaction to available technology. Its widespread use resulted from an increasing insistence, on the part of international agricultural research centers and national research programs, that agricultural research and extension lead to the rapid development of technologies usable by farmers. This is consistent with a similar call by economists for increased multidisciplinary collaboration between biological scientists and social scientists in work directed towards this same objective. Norman, for example, advocates agricultural research that is multidisciplinary, centered on farmers' circumstances and proceeds by building on current farmer practice (Norman, 1978). Dillon favors research that uses knowledge of current technology (and how it relates to the farmer's culture and needs) to identify innovations whose adoption is feasible; this suggests that research emphasis be "tailored toward



technology that matches the farmer's resource, financial and climatic environment. . ." (Dillon, 1979)

The main purpose of farmer assessment of new technology is to provide feedback from farmers. The farmer provides information to researchers and policy-makers on the consistency of recommended technology with his goals and constraints, on needed improvements to be made in the technology, and/or modifications in the technology he has adopted. Researchers use this information to formulate testable hypotheses. If the information obtained from farmers is confirmed, i.e., if the hypotheses are accepted, the information may be used in six different ways, as listed below (Harrington, 1980).

- (1) Re-analysis of the results of past agronomic trials.
- (2) Re-design of individual on-farm agronomic experiments.
- (3) Re-design of the on-farm experimental program.
- (4) Feedback to experiment station research.
- (5) Allocation of funds to research vs. extension.
- (6) Analysis of agricultural policy.

As Harrington, 1980, pointed out, farmer assessment of new technology is not the only possible kind of study of farmers' reaction to innovations. Diffusion research, as advanced by sociologists who specialize in the study of communications, contains many examples of such research. The basic purpose of such research is to "understand how new

ideas spread from their sources to potential receivers and understand the factors affecting the adoption of such innovations" (Rogers and Shoemaker, 1971). To achieve this purpose, communications specialists have engaged in such activities as modeling the innovation-decision process, listing the attributes of innovations and how they affect the rate of adoption, forming adopter categories, conducting empirical research on the role of opinion-leaders and change agents, etc. Results from communications research aid in conceptualizing farmer assessment. For example, communications research informs us that the attributes of innovations that are likely to be adopted include relative advantage, compatibility with current activities and values, simplicity, trialability (easy to try on a limited basis), and observability. Nonetheless, research in the tradition of communications does not usually have an immediate problem-solving application to a real-world program.

Farmer assessment is designed specifically as problem-solving research, and therefore, requires collaboration among various disciplines especially between economics and agronomy. They also require the participation of the farmers. Also researchers conducting farmer assessment are usually those in charge of the rest of the technology-generation process, or have immediate access to them.

In the research process, the farmers are divided into different categories as users, ex-users and non-users of the practices that form the new technology. Each farmer is then

called to provide ex-ante information on problems and practices so that experiments may be planned, to provide experimental locations, and to assess the usefulness of resulting recommendations when implemented in his own complex environment of multiple goals and limited resources. Finally, these procedures are required to be sufficiently simple and inexpensive that national research programs with limited resources can implement them, even when small farmers comprise the target group (Harrington, 1980).

### 3.2. Identifying Evaluation Criteria

The integral part of an evaluation system rests on finding a satisfactory set of criteria for gauging the level of performance both in the process and impact evaluation category. Many writers in this area (see, for instance, Pfiffner and Sherwood, 1960), suggest that any serious consideration of judgment about implementation and the effectiveness of performance turn to the question of objectives to ascertain the extent to which the anticipated target is being approached. In addition to clearly defined program objectives, the essential evaluation task entails specifying quantifiable indicators, with explicit stipulation of the expected effects at the relevant points--such as the farm, regional, and/or national levels. For instance, Pétry, 1981, suggests numerous indicators (see Appendix 3 and 4) of monitoring systems for agricultural projects. However, he notes that the corresponding indicators for each project must be

defined precisely in relation to the management requirements and data availability in that situation.

In addition to the indicators of input, output, performance, and impact, Pétry also suggests the following variables as useful indicators of external conditions:

- Input prices
- Input availability
- Farm produce prices
- Demand for farm produce
- Cost of credit
- Climate . . . rain, temperature
- Pests and diseases . . . crops, livestock

However, as Carruthers and Clayton, 1977, attested, the choice of criteria often poses a major methodological problem inhibiting a systematic approach to evaluation. The issues range from conceptual deficiency to common practical hindrances. For example, multiple-objective of an integrated rural development program raises a conceptual problem if, and when, it attempts to maximize all objectives simultaneously. The problem primarily arises due to the lack of a valid common denominator to serve as a criterion for gauging the performance of the multiple objectives. This forces evaluators to introduce some form of weighting system to pass comparative judgment on achievement levels of differing objectives. Even if the weighting procedure is accepted in principle, it further leads to another practical problem in deciding whose responsibility it is to determine the weights.

Another theoretical problem arises when some objectives are mutually exclusive. Such problems are likely to emerge in cases where objectives are decided on the basis of bargaining and compromise among interest groups during the stage of policy formation. If an interest group has been persuaded to accept the policy with the hope that the implementation version would be in its favor, such a group is likely to contest the outcome as undesirable during the latter phase.

Other practical difficulties are likely to emerge in comparing results achieved by the end of the project with the objectives set in the initial stage. The problem arises in accounting the reasons for the failure to attain project objectives.

Disparities between expected and achieved outcome levels can result from varied causes. For instance, overestimation of achievable objectives at the outset leads to large disparities. In such cases, farm level yields cannot be achieved as expected, if the projection was based on experimental research results, revenues may not approach anticipated levels, if assumed prices did not consider seasonal effects on price levels, and so forth. Though optimistic projections can be done to convince financing agencies of the viability of the project, it can also lead to participant disappointment, thereby distorting prospects for similar undertakings in the future.

A similar disparity can also result due to external conditions, at times unconnected with the project. Exogenous circumstances such as changes of political regimes, reorganization of institutions, changes of policy in input and product prices, input availability, inflation, drought, pests and diseases, etc., are also capable of altering reasonably feasible objectives at the formulation stage into unrealistically ambitious-looking objectives by the end of the project. The outstanding challenge to the evaluator lies in attributing the failure to achieve the anticipated objective to the correct factor, so that future operations can benefit from the experience.

### 3.3. Measurement and Valuation Issues

Nunnally and Wilson, 1975, said: "Although tomes have been written on the nature of measurement, in the end it boils down to something rather simple--measurement consists of rules for assigning numbers to objects to represent quantities of attribution." However, accomplishing this task is not so straightforward, particularly when the attributes are quite difficult to measure. Several issues of measurements can be encountered during survey design, specification of inputs and outputs, valuation of inputs and outputs, as well as in selecting the appropriate tools of analysis.

The initial task in the measurement process requires clear identification of the differences to be measured. Measurable options include the hypothetical difference between

the situation where commitment to policy has been made and the projected situation, as well as the range of situations prevailing in the time period after application of the policy. Once the measurable difference has been identified, the subsequent evaluation task involves two distinct steps. First, the specific inputs and outputs will have to be identified. Secondly, both the inputs and the outputs will have to be valued, using the proper price tag.

### 3.3.1. Physical Input and Output Specification

The inputs and outputs of an agricultural-oriented integrated rural development scheme could vary, depending on the nature and components of the intervention. Generally, however, inputs can be categorized as capital (investment) and operating (recurrent) inputs. The outputs can be categorized, also, as primary,<sup>1</sup> secondary,<sup>2</sup> and intangible.<sup>3</sup> While specification of direct inputs and outputs can be handled with only a reasonable degree of difficulty, quantification of the secondary and intangible inputs and outputs poses a tremendous challenge to an evaluator (see Prest and Turvey, 1966; Mishan, 1971; and Gittinger, 1982).

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<sup>1</sup>Primary outputs represent the immediate goods and services which emanate from the project.

<sup>2</sup>Secondary outputs represent the added value induced by the project.

<sup>3</sup>Intangible output generally refers to benefits to which value can not be assigned in monetary terms.

In most integrated rural development projects, labor and foreign exchange items are important direct input components requiring considerable attention. For instance, the quality of labor varies according to the age, sex, health, nutrition, education and experience of the labor force. Categorizing the labor input in such a detailed manner assists in analyzing and understanding the contributions of every attribute of the input. However, such details are costly and sometimes unmanageable. Hence, use of aggregation techniques such as the following, become inevitable:

- a) skilled labor component, comprising extension agents, nurses, home economists, tractor drivers, surveyors, etc.,
- b) unskilled labor component, comprising farm family labor (household head, wife, children under a specific age, and other relatives), hired labor, and exchange labor (return or non-return).

With respect to foreign exchange, the input specification task is straightforward, particularly if handled systematically. Basically, it entails a project-by-project examination to identify the input component utilizing foreign exchange resources. In many cases, this will include items such as fertilizer, sprays, insecticides, tractors and accessories, roadbuilding facilities, well-drilling equipment, etc.



### 3.3.2. Input and Output Valuation

After having specified the relevant inputs and outputs, the next step requires selecting a price for measuring value. For instance, financial and economic analysis procedures could be employed for calculating economic costs and benefits. The financial analysis focuses on projecting revenue, cost, project life and discount rate in an attempt to reveal the extent of benefit that accrues to actual and prospective participants in the project. Financial analysis permits the analyst to examine the levels and distribution of project among participants and to assess the attractiveness of the project to participants, prevailing prices are used to measure the costs and benefits. Economic analysis, on the other hand, measures the costs and benefits of a project which accrue to the nation as a whole. For example, income transfers such as government subsidies and export taxes are excluded in an economic analysis. In addition, shadow prices are used to remove distortions which may exist in the prices of foreign exchanges, inputs, and outputs (see Gittinger, 1982: decision tree for determining economic values).

Shadow pricing is a technique whereby observed prices are corrected so as to reflect the true cost of inputs and the true value of output in face of distorted markets. Squire and van der Tak, 1979, indicate the kinds of distortions shadow prices are used to correct:

"Shadow prices are defined as the value of the contribution to the country's basic socio-economic objectives made by any marginal change in the availability of commodities or factors of production. Thus, shadow prices will depend on both the fundamental objectives of the country and the environment in which the marginal changes occur. The economic environment typically will be determined by the physical constraints on resources and by various constraints that limit the government's control over economic development. Any changes in objectives or constraints will therefore necessitate a change in the estimated shadow prices." (Squire and van der Tak, 1979)

Three alternative ways can be employed for shadow pricing of project labor transferred from agriculture (Ward, 1975):

1. The opportunity cost approach: this approach entails measuring the marginal product of the worker in his previous occupation or the output foregone by the worker in his previous occupation. Several issues can be raised around the stated claims. However, it can be safely assumed that the opportunity cost or marginal value product (MVP) of agricultural labor varies according to the season, but never reaches zero even in the dry season because of non-agricultural activities and the social value placed on leisure. Hence, the need for a minimum wage rate which must be paid to provide incentive for work is established.
2. The supply price (reservation price): this approach suggests a price at which a laborer is just able to meet the out-of-pocket opportunity and psychic costs of accepting employment in the project activity. In

the absence of externality, the supply price of labor provides a good measure of welfare change, since it includes consideration of (a) alternative employment opportunity and (b) direct cost of the new job.

3. The social cost of labor (social accounting price): this approach incorporates into the shadow price of labor the relative value of saving and consumption.

As William Ward, 1975, suggested, the "appropriate" shadow wage will depend upon the objective sought. For instance, if "efficiency" is the only objective, the supply price of labor provides the best estimate of the welfare costs; while the social cost of labor's shadow price becomes more appropriate in the case of a dual objective of efficiency and growth. Use of the supply price of labor approach assumes absence of major externalities, while the social cost of labor approach requires above all other things acquisition of a social time preference rate which is impossible to establish empirically. If the labor market is assumed to be competitive, the market price for labor could be designated as "best estimate of the opportunity cost of labor approximating MVP." It is also important to consider expected peak labor demand variation in the computation, since it occurs in agriculture and similar industries.

Conventionally the shadow wage rate (SWR) for unskilled labor is taken to be the opportunity cost of a worker removed from agricultural production in the traditional

sector plus the cost to the economy of any increase in consumption occurring as a result of his higher wage.

Assuming a very high marginal propensity to consume or zero saving among low people in poor countries, and given that a certain percent of the minimum wage represents transfers paid by workers (social security and other taxes) the increase in consumption resulting from Formal Public Sector employment created can be calculated as follows:

$$\begin{array}{rcl} \text{Salary of} & & \\ \text{the Lowest} & - & \left[ \begin{array}{l} \text{Transfers} \\ \text{and Taxes} \end{array} + \begin{array}{l} \text{Produc-} \\ \text{tion} \\ \text{Foregone} \end{array} \right] & = & \begin{array}{l} \text{Net Increase} \\ \text{in Con-} \\ \text{sumption} \end{array} \\ \text{Category} & & \end{array}$$

This net increase in consumption can be considered as a benefit or a cost to the economy depending on the value a government gives to increases in consumption for low income wage earners.

For all developing countries in the world, the fight against hunger and malnutrition is a major concern of the time. As expressed in recent development plans in many LDCs, prevailing heavy subsidies of consumer goods, agricultural inputs and food production policies, attest to that concern. For these reasons, one can safely assume that any increase in consumption by unskilled workers is a benefit to the economy. Consequently, the shadow wage for unskilled labor simply equals the opportunity cost of a worker removed from agricultural production in the traditional sector.

In most developing countries, however, wages for unskilled workers are fixed by the government and are lower

than the opportunity cost of such labor, even including taxes and transfers. For this reason and given that overvaluation of foreign exchange is offset by undervaluation of unskilled labor in domestically produced consumption it can be assumed that the (SWR) for skilled labor is equal to the actual wage rate.

On the average, the shadow exchange rate (SER) indicates how much a unit of foreign currency will buy in the world market, compared to what a unit of local currency will buy domestically. The significance of SER in economic analysis of projects is emphasized when foreign exchange is undervalued such that domestic goods become more costly than their equivalents in world markets. In most developing countries foreign exchange scarcity is often a major problem. A decrease in available foreign exchange following a decline in export prices can compromise the development plans of a country highly dependent upon imported goods.

In searching the shadow exchange rate, Gittinger, 1982, hints that estimating shadow prices for foreign exchange is time consuming and at times tricky, and then points out that using the shadow exchange rate of the central planning unit enhances the comparability of the various alternative investment opportunities open to a nation. If this option is unavailable, however, one could choose calculating methods from numerous alternatives now in use (see Ward, 1979; Little and Mirlllee, 1974; Squire and van der Tak, 1975; UNIDO Guidelines, 1972). As Ward, 1975, summarizes it, the

approaches to shadow-price foreign exchange can be categorized according to three different assumptions: (a) the foreign exchange shadow price should reflect the value in terms of welfare to the economy of an additional unit of foreign exchange, (b) the foreign exchange shadow price should reflect the opportunity cost of a foreign exchange unit in other uses, and (c) the foreign exchange shadow price should be the "equilibrium" exchange rate, with varying assumptions about what the equilibrium rate may be. In principle, the first two approaches are similar, because the opportunity cost should reflect the marginal value (welfare) in alternative uses. The Harberger, 1965, approach falls under such a heading. According to this method, SER is an attempt to estimate an "index" of domestic prices compared to world market prices, since domestic prices are usually separated from world price by import duties in the case of imports and taxes or subsidies in the case of exports. An approximation of a price index of traded goods may be obtained by taking the weighted average tariff rate on traded goods, the weight in each case being the marginal change in imports and exports induced by the project. Similarly, the Little-Mirrlees, 1974, approach uses a two-stage procedure: (a) valuing tradeables at border prices, and (b) converting nontradeables using the standard conversion factor (SCF).

Domestically produced goods are valued at market prices on the assumption that the higher shadow rate for

foreign exchange more or less offsets the lower shadow wage for unskilled labor. However, valuation issues arise in the case of multiple objective integrated rural development programs, when intangible benefits emanate from such project components as education, health, research, nutrition, etc. Researchers have used different procedures to value benefits from such components in monetary terms. For instance, education has been valued by comparing the earnings of an educated man with those of one who is uneducated; health and sanitation benefits have been valued in the number of lost work hours avoided by decreasing the incidence of disease; nutrition benefits have been valued in terms of increased productivity; etc. In most instances, however, the results are considered unsatisfactory, mainly because the outcome tends to understate the value of the intangibles. The value of education is much greater than just the increase in income, while good nutrition is desirable for reasons other than increased productivity.

Even though valuation of intangible benefits may not be a direct concern in many agricultural projects, the problem is conspicuous in dealing with agricultural-oriented projects that include such components as extension, agricultural education, agricultural research, etc. The valuation of such activities can be handled using the least cost<sup>1</sup>

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<sup>1</sup>It is often identified as the "cost effectiveness" approach, particularly when the effectiveness of programs in achieving a goal (an effect) is linked to cost.

approach. This method requires identifying and quantifying the benefits (kinds of education provided, number of persons trained, number of jobs created, etc.) and determining on a present-worth basis the least expensive alternative combination of tangible costs that will realize the same intangible benefits.

### 3.4. Choice of Analytical Tools

Depending on the purpose of the evaluation, researchers have a wide spectrum of options for selecting tools of analysis during evaluation. Besides the cost-effectiveness approach described earlier, tools that can be used in project analysis include farm budgeting, cost-benefit analysis, linear programming, regression analysis, internal rate of return, and net present value technique. The first two methods (farm budgeting and cost-benefit analysis) are among the tools that are often employed in agricultural project analysis.

Likewise, the intended uses of the evaluation results also determine the suitability of quantitative and/or more qualitative methods in conducting the evaluation research.<sup>1</sup> Although each of these analytical tools reflects different strengths and limitations, they all share some of the common

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<sup>1</sup>See Dominique, 1982, for discussion on theoretical and operational issues regarding rate of return on capital criterion, Harberger-Sandmo-Dreze criterion, Little-Mirrlees criterion and Dasgupta-Marglin-Sen criterion.



methodological problems associated with input-output specification and valuation, as well as in the determination of the appropriate discount rates.

#### 3.4.1. Farm Budgeting

Farm budgeting is a farm management technique mainly used to derive performance standards for a total farm operation. It can also be used for comparing effects of a new enterprise mix (additions as well as deletions) or production technique in a partial budget framework. The task of a partial budget analysis can be accomplished by comparing costs and benefits under the following framework:

<u>Costs</u>	<u>Benefits</u>
a. Added costs: _____	c. Added benefits: _____
b. Reduced benefits: _____	d. Reduced costs: _____
Total: _____	Total: _____

An analysis of this nature focuses on the performance outcome of the farm in a one-year planning period. If the required gestation period involves more than one year, the capital budgeting approach can be used to account for the time value of money, particularly for assessing the present worth of future cash inflows for comparison with current cost outlays.

However, there are numerous methodological issues to be addressed in constructing budgets, especially from cross-sectional data (see Dillon et al., 1980). In a broader

framework, Eicher and Baker, 1982, outline the following methodological problems:

- Lack of a standard approach in deciding what to include in farm budgets
- Valuation of inputs and outputs, including valuation of capital services
- Inability to account for changes over time and space budgets based on cross-sectional data
- Problem of interpreting results from budgets constructed from average input/output relationships on surveyed farms.

#### 3.4.2. Cost-Benefit Analysis

Cost-benefit analysis purports to measure and compare the respective magnitude of aggregate costs and aggregate benefits for alternative projects over time. If a project lasts more than one year, future cost and benefits streams are discounted to reflect their present value. There are three discounted measures commonly used for agricultural projects: the benefit-cost ratio, the net present worth and the internal rate of return.

The expression:

$$C.B. = \frac{\sum_{t=1}^n \frac{B_t}{(1+i)^t}}{\sum_{t=1}^n \frac{C_t}{(1+i)^t}}$$

where: B = Benefits in each year  
 i = interest (discount) rate  
 t = 1,2,..., n  
 C = Costs in each year  
 n = number of years

implies a criterion that project acceptability rests on aggregate benefit exceeding aggregate costs. Dominique, 1982, provides two major reasons contributing to a wide use of cost-benefit analysis in developing countries. First, he points out, lack of skilled manpower and adequate statistics limits engaging in economy-wide model building. Secondly, the limited scope of rival tools such as operations research and the cost effectiveness approach have enhanced the increased use of the cost-benefit analysis in project evaluation, particularly in making long-term project investment considerations.

The following are some of the major methodological issues associated with the cost-benefit approach that demand the evaluator's attention:

- quantification and valuation of costs and benefits;
- identification of opportunity cost of capital;
- development of discount rate weighting procedures, if desired to account for income distribution effects (see Mishan, 1982, for issues in valuation);
- recognition that cost-benefit analysis is partial, and hence assumes that project effects are not big enough to change price structure.

### 3.5. Issues in Data Collection

#### 3.5.1. Lack of Solid Data Base

The uncertainty of available statistics in most less developed regions, especially in the Sahel, has been adequately documented (see Eicher et al., 1976; Berg, 1977; Moris and Brandel, 1982). With regard to the eastern region of Upper Volta, for instance, Eicher et al., 1976, indicates that the socio-economic and technical data base is woefully inadequate, and strongly expresses the need for baseline studies and development of a system for recurrent collection of agricultural information for use in making improved program decisions. Berg, 1977, also observes that it is conventional, in writing about less developed countries, to point out the weakness and uncertainty of available statistics, then to proceed to use whatever numbers are at hand . . . particularly in the least developed countries, many numbers which are in common circulation have such enormous margins of error that they should probably not be used at all. It is especially important for consumers of data--policy makers and researchers alike--to have some feeling for the degree of reliability or unreliability of the data at hand.<sup>1</sup> These problems persist in many of the poor developing countries due to some of the following reasons:

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<sup>1</sup>The following literature is helpful for researchers in obtaining accurate information from respondents of a survey: Kearl, 1976; Lansing and Morgan, 1971; Raj, 1972; Vincent, 1977; and Young, 1965.

- the statistical and research bureaus are very thinly staffed
- uncertain budget appropriations create particular difficulties in the areas of maintenance and operating costs
- bio-physical diversity among localities and regions limits usability of simple sampling techniques or easy generalization of sample results.

Consequently, as the methodological requirements<sup>1</sup> for good estimates of data are rarely met, it is quite likely at times that available estimates can be inaccurate and highly misleading.

#### 3.5.2. Issues in Rural Surveys

The assessment of project/program prospects, impacts and accomplishments require a broad array of data. To satisfy this requirement, farmer assessment procedures rely heavily on information acquired from farmers, in most instances, through a well organized survey program. Based on this information, hypotheses are formulated and tested by researchers, and suggestions are made for changes in agromomic experimentation and agricultural policy.

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<sup>1</sup>For instance, the methodological requirements for good estimates of production data include rigorous sampling of acreage, regularity of measurement, systematic and careful crop cutting, weighing, measurement of humidity content, etc.

The relevant data can be gathered from farmers using any one or combination of the three major alternatives for obtaining information: a single-visit or a multiple-visit approach, random or purposive sampling, formal or informal survey. Though each alternative can be used in a variety of conditions, it often remains to be the initial role of the researcher to choose the best combination under given research circumstances. The issues surrounding each of the options as well as broad and methodological issues in survey design are well summarized in Eicher and Baker, 1982.

In order to improve the quality of information from farmers, farmer assessment procedures advocates the need to stratify the target population by "use-class", i.e., users, non-users and ex-users of each input or practice. The assessment focuses on those farmers who have obtained, to their satisfaction, sufficient information upon which to base a decision. Thus, instead of asking all farmers the same question, it would be possible to design relevant questions for each category, such as, for instance, why and how users use, why ex-users did quit, and why knowledgeable non-users decided not to use.

Eicher and Baker, 1982, also pointed out that among the major methodological issues debated in francophone countries during the decade was whether studying the production unit (exploitation agricole)<sup>1</sup> is sufficient to explain the

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<sup>1</sup>The term exploitation agricole refers to a production unit where people work together on the main food grain field

dynamic forces affecting the decisions of small farmers, or whether studies at different levels--clans, villages, age groups, etc.--can provide more reliable information. Similarly, Norman et al., 1981, indicates another dichotomy between francophone and anglophone countries. While researchers in anglophone Africa aggregate labor units using the concept of "man equivalents," studies in francophone countries rely on a stock measure of labor called the *actif*. An *actif* is often defined as a person between ages 15 and 59. Researchers object to the *actif* approach to labor measurement on different ground: first, the *actif* concept tends to understate the stock of labor available for agricultural activities, particularly in peak seasons, when most persons over the age of 10 work in the fields. If the proportion of labor coming from individuals under 15 and over 59 is significantly different among sub-samples of households, the net return per *actif* will be overestimated in the households where non-actifs make a major contribution to farming activities. Secondly, the *actif* concept does not make any allowances for differences in productivity and labor use by seasons.

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and eat as a group from the output of the main field (Ancy, 1975). While English-speaking researchers undertaking survey research have generally relied on the household as the unit of analysis (often defined as "people who eat from the same pot"), researchers in francophone countries consider the question of the proper decision unit to investigate to be an important unresolved issue (Monnier et al., 1974; Maynard, 1975; Ancy, 1975; Kleene, 1976; Couty, 1979; Gastellu, 1980).

#### 4. Implications for Evaluating the EORD/IRDP

##### 4.1. Institution Building

An earlier discussion on the administrative capacity of the Eastern ORD was presented in the project paper prepared during the initiation of the EORD/IRDP (see Stacy et al., 1974). Then, Eicher et al., 1976, analyzed the implementation and future development potential of Upper Volta's Eastern ORD rural development organization. The report by Eicher et al., 1976, urged the ORD to include an integrated training program as one of the three foundation stones<sup>1</sup> in the ORD's program. In subsequent years, the EORD/IRDP technical assistance team has carried out an applied research component as well as other activities contributing towards overall institution-building objective of the project. In 1978, Poulin et al. prepared an interim evaluation report on the overall progress of the project. Unfortunately, however, there has never been a systematic information gathering effort during the implementation process in order to gauge the ongoing institution-building effects of the project activity. Therefore, the assessment of the prevailing administrative capacity of Upper Volta in general and the Eastern region in particular, as well as the evaluation of the pattern of success and failure of the

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<sup>1</sup>The other two proposed foundation stones were:  
(a) implementation of a production and marketing program, and  
(b) applied research and evaluation.



institution-building effort of the various service components of the EORD/IRDP will be conducted using secondary data from published documents. The administrative capacity assessment focuses on the following topical areas:

- development objectives,
- development priorities,
- administrative arrangements,
- financing and project management,
- cultural factors, and
- physical factors.

Likewise, the pattern of success and failure of the institution building effort of the EORD/IRDP will be analyzed with particular reference to the following:

- persons trained;
- persons served;
- procedures instituted;
- efficiency in coordinating services;
- cost effectiveness in delivering services;
- loan repayment performance;
- decision and planning mechanisms (existence of appropriate incentives, participation/feedback, and data availability);
- infrastructure in place.

#### 4.2. Impact on Agricultural Production

The evaluation of the impact of the EORD/IRDP on agricultural production will be based on the farm level data and

available documents. The focus of the analysis is to determine area effect, employment effect, yield effect and income effect of the project at the farm level. An overall synthesis will be attempted examining the extent of Farmer Assessment Research orientation possibility, and the role of the EORD in promoting rural development in the region. It is hoped that the study can draw useful lessons that could be used in designing and operating future EORD, as well as other similar projects.

### 5. Summary

The main purpose of this chapter is to outline and discuss the major methodological issues that are involved in evaluating agricultural oriented integrated rural development schemes. The initial section of the chapter presents process and impact evaluation. Even though each is identified under different name tags by different evaluators, process and impact evaluation comprise the two types of evaluations most discussed in the literature.

Process evaluation, which is often labelled as formative evaluation, implementation assessment, farmer assessment, monitoring, ongoing evaluation, and/or input evaluation aims at accomplishing at least three purposes. First, process evaluation gauges the availability of administrative capacity to satisfactorily perform required basic project implementation tasks while at the same time promoting the institutional capability to learn quickly from the continuous

evaluation of the factors surrounding its organizational environment. Second, it focuses on ascertaining whether or not the program is approaching the appropriate target population and/or area. Third, process evaluation can concentrate on farmer assessment in order to foster a clear understanding of farmers' experiences with technology. Ultimately, process evaluation aims at enhancing coordination, permitting problems to be diagnosed at an early stage, and putting forward suggestions to eliminate likely future bottlenecks. In so doing, process evaluation assists in promoting self-sustaining rural development capable of financing recurrent cost requirements by ensuring benefit continuation and growth after the expiration of initial funding arrangements.

Impact evaluation is often identified as summative, ex-post, effect and/or output evaluation. It provides information to policy makers and planners by examining the physical, economic, social, and environmental impacts, so that appropriate decisions can be made on future programs.

The leading methodological issues discussed in the chapter include definitional problems, identification of performance criteria, and measurement and valuation issues. The first attempt in the discussion of the definitional area is to illustrate the extent of confusion that arises in assessing the evaluability of IRD schemes. The root of the problem is recognized to be the existence of varied definitions for the strategy of IRDP. Then, the concept of

appropriate agricultural technology has been briefly discussed stressing the merits of process approach for effecting technological change. The process approach emphasizes ongoing evaluation of project components so that the most appropriate technological package can be defined out of the space specific development situation. In this connection, farmer assessment is described as an indispensable mechanism for acquiring feedback from farmers regarding their reaction to available technology.

The problems of measurement and valuation are presented under four subsections. The first subsection continues to enumerate and explain the problems associated with physical input and output specification. The inputs are defined as investment and recurrent inputs, while the outputs are categorized as primary, secondary, or intangible outputs. The second subsection deals with valuation issues of both inputs and outputs within the framework of financial and economic analysis. The financial analysis issues arise in attempting to reveal the extent of benefit accruing to actual and prospective participants in the project; the economic analysis issues emanate from an examination of the total return or productivity of the project to the whole society, regardless of who in the society receives the benefits. Various issues have been outlined and examined, particularly with respect to valuation of labor, foreign exchange, and intangible outputs. The third subsection discusses the

existence of diverse analytical tools from which researchers can select the most appropriate for their purposes, depending on the objective of the evaluation. Among the tools that are often used to evaluate agricultural-related projects are the farm budgeting technique and cost-benefit analysis procedures. The strengths and limitations of these two procedures are briefly stated. Section four deals with issues emanating in data collection. It stresses the underdevelopment of the data base in many low income countries. Then, the role of farmer survey in collecting required primary data for assessment purposes is indicated and the need to stratify farmers by use class, i.e., users, non-users, and ex-users of each input or practice, is advocated for improving the quality of information from farmers. Major problems in farmer survey reflecting on reliability of data are also briefly explored.

The final section of the chapter examines the implication of the findings for evaluating the EORD/IRDP. Having the twofold objectives of the project at the background (developing and expanding the operational capacity of the EORD and increasing agricultural production and rural income in the region), the suggested indicators to be employed in evaluating administrative capacity, institution building and project impact on agricultural production and income are briefly outlined.

## CHAPTER III

### DESCRIPTIVE ANALYSIS OF AGRICULTURE IN UPPER VOLTA AND THE EASTERN REGION

#### 1. Introduction

This chapter has three objectives. First, it presents a brief description of the physical, economic and institutional setting of Upper Volta. Second, it discusses the characteristics of the dryland farming system in the Eastern Region. Third, it provides an overview of the EORD program.

#### 2. The Physical, Economic and Institutional Setting in Upper Volta

##### 2.1. Physical Features and the Resource Base

Upper Volta is one of the four landlocked Sahelian countries in West Africa.<sup>1</sup> It is bordered to the North by Mali, to the East by Niger and to the South by Benin, Togo, Ghana and Ivory Coast. Ouagadougou, the Capital of Upper Volta, is 1,200 km and 900 km away from the closest seaports of Abidjan in Ivory Coast, and Tema in Ghana, respectively. Upper Volta is also about 800 km away from the Atlantic Ocean (see Figure 3.1).

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<sup>1</sup>The other three are Chad, Mali and Niger.

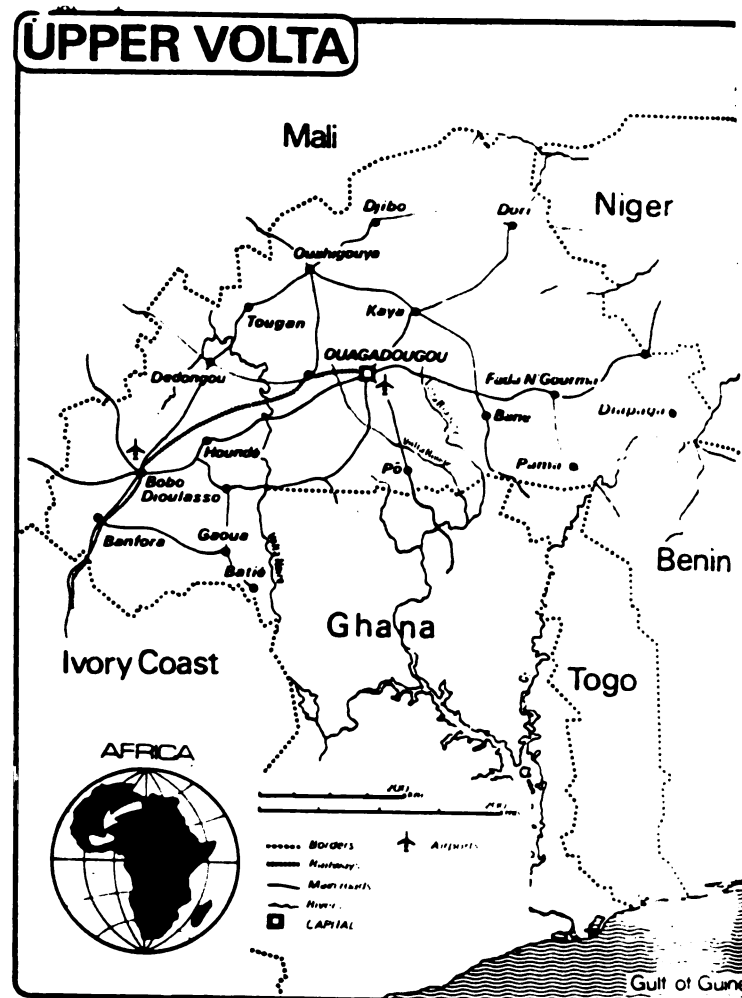


Figure 3.1. Upper Volta

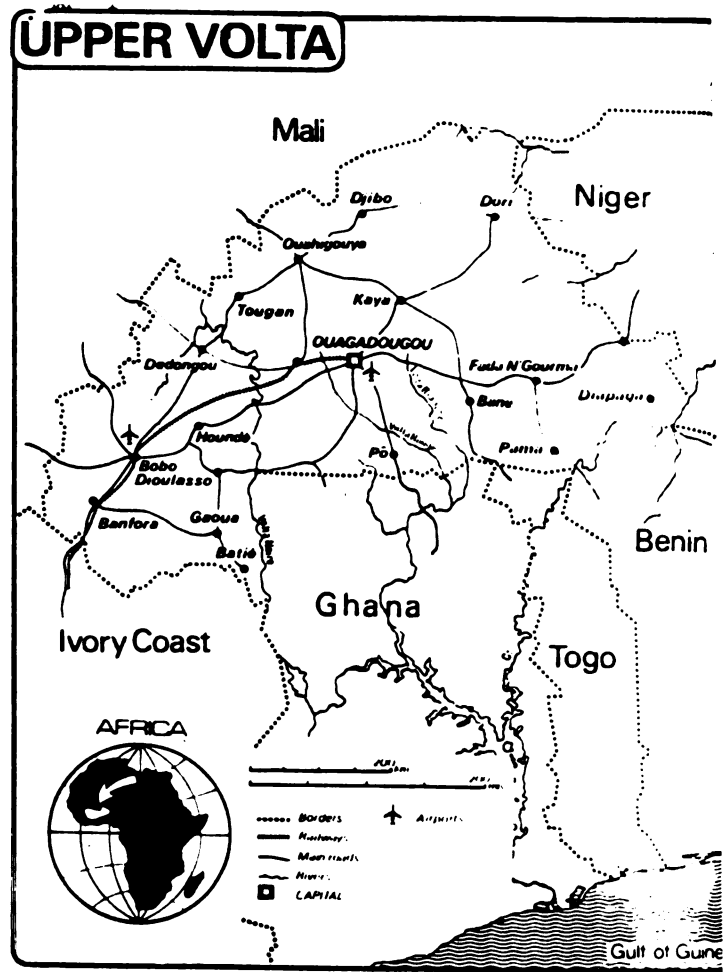


Figure 3.1. Upper Volta



TABLE 3-1

## LAND UTILIZATION

Use type	Area in '000' ha.	Percentage of the total
Arable land	5,620	20.50
Land under permanent crops	13	.50
Permanent meadows and pastures	13,755	50.16
Forests and Wood land	3,500	12.80
Other land	4,492	16.33
Inland Water	40	.16
Total	27,420	100.00

Source: FAO, Production Year Book and own percentage figures, 1979.

The country has an area of 274,200 sq km (105,870 sq miles). A 1978 data indicates a land utilization pattern depicted in Table 3.1.

According to 1975-77 statistics, about 42% of the arable land area was devoted to cereal production: the areas estimated to be under corn, sorghum, millet and rice were 7.1%, 58.8%, 30.8% and 3.3% respectively.

Generally, Upper Volta is characterized by its unfavorable climatic conditions, inadequate water supply, poor soils and lack of mineral resources. Like many of its neighboring countries, Upper Volta has a tropical climate with two seasons: a rainy season from June to October and a dry season from November to May. Rainfall ranges from 500 millimeters (20 in.) in the northeast to 1,300 millimeters (51 in.) to the southwest. The quantity of rainfall is not too low, but it is not reliable. The precipitation is concentrated in a single season, and most of the rain falls in heavy storms during the few rainy days in the wet season.

The average altitude is about 400 meters (1,312 ft.). Renankourous, in Banfora region with its 750 meters (2,461 ft.), represents the highest plateau in the country.

On the average the temperature is cool from November to February, averaging 25 degrees centigrade (about 77 degrees fahrenheit). Maximum temperature is in April and is usually between 35 and 40 degrees centigrade (95 and 104 degrees fahrenheit).

Much area of the land mass in Upper Volta is characterized by lateritic soils which lack fertility. Run-off from heavy storms creates a considerable amount of erosion on lands that are sloping or steeply inclined.

The three Volta river basins (Black Volta, Red Volta and White Volta) are the major rivers in the country. The river valleys are infested by the Simulium<sup>1</sup> damnosum fly which spreads river blindness. Similarly, some swampy areas in the country are infested by tsetse flies transmitting sleeping sickness to both humans and animals. There is, however, a coordinated international effort to control these vectors so that the land area can be brought under human use.

Upper Volta is not rich in mineral wealth. However, a manganese reserve of 13.3 million ton potential has been discovered at Tambao, near the boundary with Mali and Niger. The potentials for other mineral resources such as phosphates, zinc, lead and nickel are being studied.

Upper Volta, however, has a good human resource potential in its large population. According to a 1979 estimate, the country has a population of 6,728,000 people, much higher than the populations found in its neighboring Sahelian countries. The average density is 24.5 persons per sq. km. Most of the inhabitants are concentrated in the central part of the country leaving the Eastern and Northern areas of the

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<sup>1</sup>The common name of the genus is the "black fly."

country with sparse populations (see Table 3.2). The main ethnic groups are the Mossi in the north, Bobo in the west, Gourma in the east and Nomadic Fulani along the northern border.

In 1979, the percentage population of working age (15 to 64 years) was 53%. The percentage distribution of the labor force in agriculture, industry and service during the 1979 period was 83%, 12%, and 5% respectively. The average annual growth of labor force during the 1970-1980 period was 1.2%. It is anticipated to grow at the rate of 2.7% in the 1980-2000 period. According to a 1978 figure, the ratio of school age children enrolled in primary and secondary schools were 17% and 2% respectively. In 1976 the overall adult literacy rate was 5%.

Migration has been a dominant feature of Voltaic life, both in the colonial and post-independence periods. One of the motivations for migration during the colonial period was the need for cash, especially following the passage of the regulation that required tax payments in cash rather than in kind. Other causes that stimulated Voltaic migration in the colonial era included the system of forced labor, military recruitment and prevalence of famine. In the post-independence era, however, substantial migration has resulted due to the relatively high population density characterizing some areas of the country, combined with poor soil and the lack of expansion in non-agricultural employment

TABLE 3.2  
POPULATION, AREA AND POPULATION DENSITY, 1975

Departments/ <u>1</u>	Total Population ( '000)	Total Area <sup>2</sup> ( '000 km )	Population Density (inh. per km <sup>2</sup> )	Cultivated Area ( '000ha)
Ouagadougou/ <u>2</u>	712	21,952	35.2	400
Yatenga	505	12,293	41.1	218
Kaya	613	21,578	28.4	317
Koudougou/ <u>2</u>	727	26,324	27.6	353
Koupela	405	11,266	35.9	132
Sahel	354	36,869	9.6	186
Fada N'Gourma/ <u>2</u>	394	49,992	7.9	139
Bobo and Banfora/ <u>1/2</u>	455	43,172	10.5	251
Volta Noire	636	33,106	19.2	235
Bougouriba	358	17,488	20.5	175
Total	5,129	247,000	19.0	2,406

<sup>/1</sup> The Departments were founded in 1974 and are nearly identical to the ORD districts. The Bobo and Banfora ORDs are in one department.

<sup>/2</sup> Without city population.

Source: Census 1975 and individual ORD reports for the 1975/76 crop year.

opportunities. In 1977 it was estimated that 1 million workers from Upper Volta were in other countries, mainly in Ivory Coast and Ghana, doing seasonal work on farms, industries and service trades.

As in other countries of the region, environmental degradation limits the productive capacity of Upper Volta's natural resources. Aside from the soil degradation emanating from erosion and loss of fertility, there is a widespread deforestation and overgrazing. Deforestation has limited the availability of wood for domestic fuel and lumber products for construction. Overgrazing is jeopardizing the maintenance of the estimated 7 million heads of livestock in the country which is composed of 2.6 millions of cattle, 4.2 millions of sheep and goats, and 0.15 million of pigs.

## 2.2. The Economic and Institutional Setting

### 2.2.1. General Observations

Upper Volta is one of the poorest countries of the world.<sup>1</sup> Recently, Upper Volta was given a physical quality of life index (PQLI)<sup>2</sup> of 16. In terms of 1979 dollars, the GNP per capita was estimated to be \$180.00. In the same period the total GDP was represented by \$860 million, the

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<sup>1</sup>United Nations, General Assembly, Resolution 2768 (XXVI), Nov. 18, 1971.

<sup>2</sup>The three components of Morris' PWLI are the infant mortality rate, life expectancy at age one, literacy rate of population over age 15. PQLI for other Sahelian countries is reported to be 48 - Cape Verde; 18 - Chad; 25 - Gambia; 15 - Mali; 17 - Mauritania; 13 - Niger; 25 - Senegal.

distribution of which was 38%, 20%, and 42% from agriculture, industry and services, respectively.

Upper Volta has a predominantly subsistence rural economy based on agriculture. The agricultural sector provides a living to over 90% of the population, and furnishes nearly 90% of the exports. The farms, however, are characterized by low productivity, reflecting the combined unfavorable effects of physical, technological, human and institutional factors. As cited earlier, for instance, the overall adult literacy in 1979 was 5%, and the fertilizer consumption on farms during the same year was as low as 1 kg per hectare.

The annual average growth rate of agriculture in Upper Volta for the 1970-79 period was negative (-3.3%). The food production index has also declined about 13% during the same period. The per capita annual cereal consumption in the 1975-77 period was 186 kg. By comparison the annual average growth rate in industry<sup>1</sup> and services<sup>2</sup> was 1% and 2.9% respectively, for the 1970-79 period.

Upper Volta obtains its foreign exchange mainly from export of live animals, cotton and oil seeds. Migrants' remittances and foreign aid are also significant sources of

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<sup>1</sup>Comprises mining, manufacturing, construction, electricity, water and gas.

<sup>2</sup>All other branches of economic activity not in agriculture or industry.

foreign exchange. On the import side, the major items are fuel and chemicals, industrial raw materials, foodstuffs and capital equipment. The main trading partners of the country include: France, Ivory Coast, Germany, United Kingdom and Japan.

#### 2.2.2. Administrative Arrangements

In the pre-colonial period, the indigenous people of what is now Upper Volta were not organized into unified states. In those days, Coulibaly asserts, villages selected their own chiefs and tended to be politically autonomous (Coulibaly, 1972). In 1896, the French claimed the present area of Upper Volta; it was in 1920 that the present area of the country was formed by uniting portions from Ivory Coast, Niger and Mali.

Like all other West African French colonies, Upper Volta was under the French colonial administration from 1896 until the institution of the French Loi Cadre in 1956, which gave increased self-government status to Upper Volta. In 1958 Upper Volta became an autonomous republic in the French community until it achieved its independence in 1960.

During the colonial period, Upper Volta along with the other colonies of Afrique Occidentale Francaise (AOF) was administered by a governor general located in Senegal. The Governor General was assisted by a Lieutenant Governor who was designated for each constituent colony. Even though the Governor General had a federal Advisory Council and the



Lieutenant Governor had a Conseil d'administration, neither of them had legislative power. In all cases, the Governor General, who was responsible to the Minister of Colonies in Paris, made all legislative proposals to the Minister residing in Paris. Consequently, the Minister in Paris issued the necessary decrees as he saw fit. Thus, Upper Volta was closely tied to the centralized Paris administration until its independence.

Presently, Upper Volta is a republic with an office of the Presidency, the Premier, and 19 Ministries. Each of the Ministries, including the two offices, has a cabinet and a secretariat as well as one or more general directorates, services and other offices, including affiliated quasi-autonomous organizations.

The country is divided into 10 departments for territorial administration. These are further divided into sous-prefectures, Arrondissements and Communes or villages. Table 3.2. presents the 10 territorial administrative divisions with their areas, populations and other relevant data.

The department, sous-prefecture and arrondissements are administered by a Prefect, sous-prefect and Chef d'Arrondissement, respectively. Each is staffed by decree in the council of ministers on recommendation of the Minister of Interior and Security.

The Prefect is the representative of the government and each Ministry in his/her department. He sees that the laws, regulations and government decisions are carried out.

The Regional Development Offices (Organismes Regionaux des Developpements) are also post-independence creations in Upper Volta for administering rural development. Each Department, with the exception of Bobo, has an ORD. Bobo has two. The territorial setting of ORDs is illustrated on Figure 3.2.

The ORDs are semi-autonomous public agencies administered by a Director. The Director is named by a decree in the Council of Ministers on recommendation of the Minister of Rural Development. The ORD administration theoretically consists of a local policy group known as Assemblée General which in turn chooses a Steering Committee from among the assembly members. The assembly constituents are expected to represent a wide range of area residents, and are to meet once a year to deliberate on broader policy matters. The Steering Committee is expected to deliberate on ORD issues in a monthly meeting.

As the head of an organization attached to the ministry of rural development, the ORD Director is officially responsible to the permanent secretary of the MDR. The ORD Director also reports to the Steering Committee.

Other organizations attached to the MDR include the following:

- schools and colleges for agriculture, veterinary and forestry training
- schools for high-level training of engineers and technicians for rural equipment

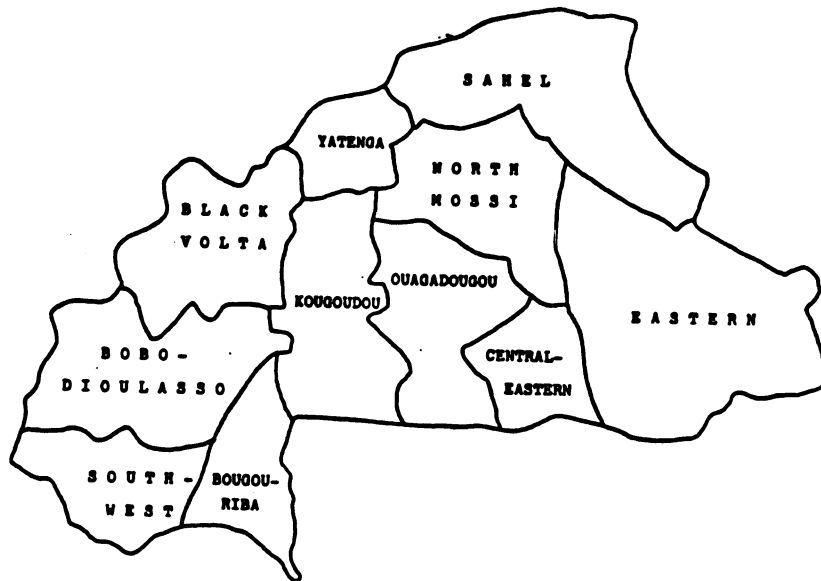


Figure 3.2 The ORDs of Upper Volta

- CILSS; National Office for Waters; For Dams and Irrigation
- Rural Development Fund; National Cereals Office
- Applied Research Organization; Development of Animal Resources, etc.

Other rural oriented development activities in the area of public health, education, public works, environmental programs, planning, etc., are administered under independent ministries mainly by dispatching field representatives to the respective departments.

#### 2.2.3. Development Objectives and Priorities

The country's development strategy since the 1960's has been guided by policies defined in a national development plan. Even though there have been planning attempts since 1963, it is only since 1967 that they were taken seriously. The latter four plans are: the plan cadre 1967-1970, the Intermediate plan 1971, the five year plan 1972-1976, and the 1977-1981 plan. As in many developing countries, the plans have been "Top Down" oriented sets of project proposals, heavily relying on external sources of financing.

In addition to specifying the desired goals, the plans also project the required investments by sectors. The aggregate intended resource allocation in the last four plans is presented in Table 3.3.

Some problems faced in implementing agricultural strategies include: uneven population distribution,

TABLE 3.3  
 PLANNED INVESTMENT BY SECTOR, 1967-1981  
 (Millions of F.CFA)

	1967-1979		1971		1972-1976		1977-1981	
	Amount	%	Amount	%	Amount	%	Amount	%
Rural	7,812	28.5	1,994	23.4	19,897	31.5	78.5	21
Infrastructure	8,326	30.3	3,722	43.8	17,413	27.5	143.60	38
Industry (Modern)	5,508	20.1	1,704	20.1	12,795	20.2	112.1	30
Social	4,831	17.4	559	6.6	8,522	13.5	39.4	11
Other	1,035	3.8	519	6.1	4,616	7.3	--	--
Total	27,512	100	8,498		63,243	100	373.6	100

Source: R.H.V. plan cadre 1967-1970 (Paris 1968); R.H.V., president de la Republique, plan--Cadre de Haute volta, annee interimaire 1971 (Ouagadougou, 1970);

R.H.V., premier Minstere, projet du plan quinquennal 1972-1976, Ouagadougou, 1972)

Planning Ministry, known as the Ministry of planning and Cooperation since mid 1978. (Third Five year Development Plan)

maintaining recurrent project costs, inadequacy of infrastructures, organizational shortcoming; distortion in input and output markets, weak and at times counterproductive incentive systems.

### 3. Characteristics of Dryland Farming System in the Eastern Region

#### 3.1. Agroclimatic Characteristics<sup>1</sup>

The Eastern Region, officially known as the Eastern Department, comprises the same land area covered by the EORD (Organisme Regional de Developement). It accounts for 18% of the national territory making it the largest of the 10 departments (see Figure 3.2, Tables 3.2 and 3.3). As the ORD covers a large geographic area, there are substantial differences in the agroclimatic and demographic characteristics of the various sections of the region. Table 3.4 presents the agroclimatic characteristics of the 12 zones of the Eastern Region.

The region has two climatic conditions: Sahelian type in the North, characterized by average annual rainfall of about 600 mm, and Sudanian type in the South with annual rainfall of around 1,000 mm.

During the dry season, humidity is low with the Harmatan, a dry hot wind, blowing from the Sahara. The average monthly temperature varies between 25 degrees centigrade in January, to 31 in April.

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<sup>1</sup>For an extended discussion of the physical attributes of the Eastern Region see Mehretu, 1979, 1980, and 1982.

TABLE 3.4

## AGROCLIMATIC CHARACTERISTICS OF SURVEYED ZONES

Zone	Approximate Population Density <sup>a</sup> (persons/ km <sup>2</sup> )	Dominant Ethnic Group	Major Soil Types <sup>b</sup>	Estimated Longterm Average <sup>c</sup> Rainfall	Listed by Order of Importance:	
					Major Crops	Livestock Types
1. Bogande	27.1 <sup>d</sup>	Gourma	leached sandy soil	690	millet + sorghum + sesame, groundnuts	goats, sheep
2. Mani	17.8 <sup>e</sup>	Gourma	leached sandy soil	610	sorghum + sesame, groundnuts	sheep, goats
3. Piela	32.1	Gourma	leached sandy soil	750	millet + sesame, groundnuts, rice	goats, sheep, cattle
4. Logobou	44.3	Mossi	poor lateritic soil	880	millet + cowpea, groundnuts, rice	goats, sheep,
5. Logobou	40.0 <sup>f</sup>	Gourma	silty to sandy clay	960	sorghum + cowpea, sorghum + Niadig, groundnuts, rice, tubers	sheep, goats, cattle (taurin)
6. Partiaga	24.2	Gourma	hydromorphic black clay or sandy clay	900	sorghum + cowpea, maize, rice, tubers, cotton	sheep, goats, cattle
7. Yonde	13.0	Mossi	black clay over- laying hydromor- phic vertisols	900	millet + sorghum + cowpea, groundnuts	goats, cattle, sheep
8. Diapangou	14.7	Gourma	clay and sandy clay	910	sorghum + millet + cowpea	cattle, sheep, goats

TABLE 3.4-Continued

Zone	Approximate Population Density <sup>a</sup> (persons/ km <sup>2</sup> )	Dominant Ethnic Group	Major Soil Types <sup>b</sup>	Estimated Longterm Average <sup>c</sup> Rainfall	Listed by Order of Importance:	
					Major Crops	Livestock Types
9. Botou	14.9 <sup>h</sup>	Gourma	sandy clay and black clay	858	sorghum or millet + + cowpea + sesame, groundnuts, cotton	cattle, goats, sheep
10. Kantchari	4.3	Gourma	sandy to sandy clay	870	sorghum + millet + cowpea, maize, manioc, cotton	cattle, sheep, goats
11. Ougarou	3.6 <sup>i</sup>	Gourma	clay	880	sorghum + cowpea, maize	cattle, sheep, goats
12. Pama	2.7	Gourma	hydromorphic black clay or sandy clay	1060	sorghum + cowpea, m sorghum + Niadi <sup>g</sup> , tubers, cotton, rice	goats, cattle (taurin)

SOURCE: Farm Survey Data and Gregory Lassiter, 1982.

<sup>a</sup>1979 estimates taken from Mehretu and Wilcock (1979, Table 3, p. 20).

<sup>b</sup>From Bureau de Production Agricole, "Determination des Zones Homogenes en Vue de l'Installation d'Un Reseau d'Essais Mult caux", ORD de l'Est, Fada N'Gourma, Upper Volta, August, 1977.

<sup>c</sup>From J. Weldring, "Synthese sur les Amenagements Hydro'Agricoles dans l'ORD de l'Est: Fada N'Gourma", Direction du Fonds Developpement Rural, Ouagadougou, May 1979, pp. 5-6. Weldring took his fingers from an uncited 1974 S.A.E.D. report and thus they probably represent 20 year rainfall estimates extrapolated from a few national rainfall stations from similar latitudes. In cases where Weldring did not present an estimate



Table 3.4-Continued

for a survey village, regional averages were used: Bogande (Bogande + Thion), Mani (Coala), Botou (Vilanga + Yamba), and Diapangou (Fada N'Gourma).

<sup>d</sup>Density for Thion canton used.

<sup>e</sup>Density for Coala and Bogande cantons used.

<sup>f</sup>This is a rough estimate of the effective population density in the survey area. The density of the Gobnangou canton is only 9.8, but the majority of the canton area is non-arable rock ridge or wildlife reserve.

<sup>g</sup>Niadi is a short season, 60 day millet grown only in the wetter regions of the EORD.

<sup>h</sup>Density for Bilanga canton used.

<sup>i</sup>Density for Matiacoali canton used.

The region represents a vast plain with very few topographic features. The highest elevation is in the Soula hills, West of Coala with a peak of 437 meters. The lowest elevation is found in the South portion of the region where Ouale river reaches the border with an elevation of about 138 meters.

The area is covered with soils of different characteristics. Based on soil potential analysis, most of the region's soils are described to be of a medium potential for dry land agriculture; there are also soils unusable for crops but could be used for extensive livestock raising, reforestation and tourism (see Table 3.4 for description of soil types).

Water is relatively abundant in the rainy season, but most rivers dry up in the dry season, leaving temporary water holes in the form of ponds in the low lands. Shallow rural wells are also dug to serve as water sources. It is not however uncommon for these water sources to dry up towards the end of the dry season causing a general shortage of water for both humans and animals.

The main road system in the region is the one all weather road from Ouagadougou to Niamey. It passes through Fada, the center of the region. In most of the year, particularly in the rainy season, access to many areas is quite limited, and delivery of inputs or marketing of products is hardly possible.

### 3.2. Farmland and Household Characteristics

Like all other departments, the Eastern Region is administered by a Prefect, and according to the 1974 decree (RHV, 1974) the department is subdivided into Sous-Prefecture, Arrondissement, Commune or village. The village is the smallest unit of territorial administration, and there were 639 villages based on the 1975 census.

According to a recent estimate, the Department contains about 442,559 inhabitants which is about 7% of the nation's population. Having an average population density of 9 persons per sq. km., the region is the least densely populated of all the departments.

The Region is inhabited with three major ethnic groups. The Gourmantche, Mossi and Peuls (or Fulani), comprising 64%, 28% and 7% of the population, respectively. The Housa and Zerma represent the balance of the population (see Table 3.4 for the dominant group in the settlement pattern).

The overall distribution of the population indicates that most of the people of the EORD are concentrated in two regions: one extending from Coala to Soudougui, in the west, and the second around Diapaga and Logobou in the east. Some 16,000 sq. km. in the south of the ORD is almost uninhabited (see Table 3.4 for approximate population density).

Historically shifting cultivation has been the dominant agricultural pattern of Gourmantche farmers. In this system of cultivation, a farmer cultivates a piece of land,

and after some time abandons it to fallow, and moves on to clear a new piece of land. Presently, two common farming techniques in the region comprise hoe farming and animal traction farming.

### 3.3. Main Household Enterprises

#### 3.3.1. Crop Production

Cropping practices in the Eastern Region follow the soil and rainfall patterns. But the most widely grown food crops are Sorghum and Millet. Major cash crops grown are peanuts or ground nuts and sesame, rice, cowpeas (niebe) and cotton. Other minor food crops grown are corn, ground peas, okra, red pepper, etc. Yams are grown in pama area both as food and cash crop.

#### 3.3.2. Livestock Production

In addition to crop farming livestock is an important enterprise in the Eastern Region. The cattle population in the region ranges from 350,000 to 400,000 with 450,000 sheep and goats. The value of herds<sup>1</sup> per household ranges from 148,965 FCFA in hoe farming households to 349,385 FCFA in households using animal traction.

#### 3.3.3. Off-Farm Activities

Off-farm activities are also important sources of income for many farmers in the Eastern Region. The

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<sup>1</sup>Calculation of herd value includes cattle, sheep, goats and fowl.

compositions of the major off-farm activities and their relative importance as a source of income will be explored further below.

#### 4. An Overview of the EORD Program

The EORD was created by decree No. 68/279/pres in 1968 (RHV, 1968), but was officially constituted with Assemblée General and Comité de Direction in 1974 (RHV, 1974). Having arranged for outside donor assistance (Société d'Intervention), the EORD was set out to attain the following objectives<sup>1</sup>:

##### 4.1. Objectives of the EORD

1. Promote rural productive activities by:
  - a. Intensifying agricultural activity and increasing the volume of output in the production of crops, livestock, vegetables and fishing
  - b. Improving the quality of agricultural output
  - c. Assisting rural producers to improve techniques of harvesting, storage and sales of their products
  - d. Providing a mechanism for the provision of inputs in rural production
2. Improve rural productive infrastructure by:
  - a. Organizing arrangement and management of water wells

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<sup>1</sup>Objectives as paraphrased by Mehretu, 1979.

- b. Organizing land use zones for rural production
  - c. Organizing management of bottom lands (bas fonds) and plains
  - d. Improving the habitat of rural households
3. Promote social activities in rural areas by:
- a. Organizing functional training for farmers
  - b. Formation of functional agricultural production teams
  - c. Organizing producer groups (Producer Association) for farmers as well as for artisans
  - d. Providing information and animation to rural communities in rural development practices.

The ORD statutes are generally uniform. As Gregory's (1974) report on Ouagadougou and Sud-Ouest ORDs indicates, operational actions of these two ORDs were geared towards:

- 1. aiding rural population through extension services and technical training
- 2. popularizing improved techniques in order to improve production
- 3. aiding in the collection, processing, and marketing of products
- 4. assisting in giving credit
- 5. improving rural crafts
- 6. helping improve the land, and
- 7. organizing the rural population at the Village level.

#### 4.2. Organizational Arrangements of the EORD

The EORD is headed by Director, assisted by a local policy group called Assemblée General. The purpose of the group is to elaborate general policies for the ORD, in a meeting held once a year. It can contain 30 to 60 members including high-ranking local civil servants, political notables and representatives of religious groups of the community. From the group, a 10- to 15-member Steering Committee known as Comité de Direction is selected to meet once a month and deliberate on policy matters concerning the EORD. The ORD director reports to the Steering Committee as well as to the Permanent Secretary of the Ministry of Rural Development.

The most recent organizational structure of the EORD and its link with MDR is charted on Figure 3.3.

As signified by the chart, the EORD headquarters in Fada is composed of six bureaus (departments) each with a number of sections and subsections. In early 1980, there were 343 employees of the ORD, of which 115 were assigned at headquarters. The rest of the employees were located in the field at three different levels: 8 sectors, 24 subsectors and 144 extension units.

The budget for EORD comes from a civil service budget covering salaries and allowances for permanent civil servants and an ORD budget including salaries and allowances for extension agents, operation and capital expenditures.

Figure 3.3 Current Organizational Structure of the EORD



The overall budget<sup>1</sup> of the EORD which was 70 million francs CFA in 1972, reached a level of 147 million francs CFA in the 1977-78 fiscal year.<sup>2</sup>

In the 1972 period, the personnel budget<sup>3</sup> was 28 million francs CFA. It increased to 61 million and 135 million francs CFA in the 1977-78 and 1979-80 period respectively.

#### 4.3. The EORD Integrated Rural Development Project

Within the framework of the stated operational mandate, the EORD has launched a number of specific rural development programs, some specific elements of which included the following<sup>4</sup>:

1. Diffusion of new methods of farming and technological components
2. Management of rural resources, particularly bas fonds (bottom land) and water courses
3. Improving market gardening practices
4. Improving practices in the cultivation of cash crops with particular emphasis on peanuts and cotton
5. Assisting in building rural infrastructure, including construction of grain storage and water wells

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<sup>1</sup>Does not include rural credit loan allocations (see Chapter IV).

<sup>2</sup>Fiscal year in Upper Volta runs from April 1 to March 31.

<sup>3</sup>For permanent employees and extension agents, does not include other covered under operations costs.

<sup>4</sup>Programs as outlined by Mehretu, 1979.

6. Expanding the capabilities of young people by creating youth clubs for developmental purposes
7. Creation of Groupements Villageois for the purpose of development of market gardening and the like
8. Livestock breeding especially to improve stock for farm work
9. Afforestation programs with particular emphasis on reducing or preventing soil erosion.

The Integrated Rural Development Project (IRDP) was designed in 1974 by USAID, to provide technical and financial assistance to the EORD. The project was formulated with twofold purposes. First, to develop and expand the capacity of the EORD, and second, to increase agricultural production and rural income in the region.

In order to put in place the technical assistance component of the project, a contract was signed with the Department of Agricultural Economics at Michigan State University beginning in 1977. According to the original project paper, there were 26 separate outputs expected from the project (USAID, 1974). The overall objective was to create four intensive development centers in high-potential areas, called Centers of Progress (Growth Regions) (Foyers de Progress) and provide concentrated extension and related supporting services. However, the concept of Foyers de Progress has not been completely implemented due to constraints encountered in the initial phase of the operation.

Consequently, the MSU technical assistance team undertook an ORD-wide applied research, including a regional planning survey, and an implementation program in production, marketing, credit and cooperatives, livestock and range management activities. An audiovisual program was added to the project component in September 1978.

In mid-1980, the composition of the technical assistance was scaled down to two areas: the credit and cooperative component, and a farming systems survey based on low land (bas fond) rice farming. The technical assistance in the credit area continued until the Michigan State University technical assistance contract ended on June 30, 1981.

### 5. Concluding Summary

This chapter has attempted to provide an overview of the factors that have the potential to influence the technical possibility, economic feasibility, socio-cultural acceptability and the administrative workability of agricultural policies in the Voltaic setting. The presentation presumes that effective policy formulation or realistic performance assessment entails a good understanding of such variables emanating from the physical, economic and institutional aspects of the society.

As was pointed out, Upper Volta does not possess natural resource endowment conducive for stimulating agricultural production. Aside from the potential inherent in its large number of the rural population, the country is broadly

characterized by its poor soil, irregular rainfall, and shortage of water. Its unfavorable natural resource potential is further aggravated by environmental degradation such as soil erosion, deforestation, and overgrazing; its landlocked position, absence of mineral wealth, and a continuing out migration of large numbers of people in the working age, not only from rural to urban centers but also from the country.

Consequently Upper Volta is one of the poorest countries in the world. GNP per capita in 1979 dollars was \$180.00. Its predominantly rural economy (agriculture supports 90% of the population) is characterized with low level of productivity. The annual average growth rate of agriculture in Upper Volta was negative (-3.3%) in the 1970-79 period. In the same period, the food production index has declined about 13%.

The country's development strategy since independence has been guided by series of development plans. The plans which are of "top down" orientation stipulate goals and investment allocations to various sectors. According to the 1977-81 development plan, for instance, the projected investment allocation was 21%, 38%, 30% and 11% for rural, infrastructural, industrial and social sectors respectively. Much of the projected allocations were made in anticipation of substantial funding to come from external sources.

One cause for concern in the food production strategy formulation is the uneven population distribution such as the

dense population in the Mossi highlands vis-a-vis the scattered settlement in most portions of the EORD. In this regard, the critical policy question facing decision makers includes determining trade offs between intensification strategy in the first as opposed to implementation of settlement options in the latter case.

The overall priority concern in improving agricultural productivity and rural income is centered on promoting dryland farming while at the same time expanding irrigated agriculture. The focal point of the effort is on increasing yield, promoting marketing and pricing policies and fostering human capital formation.

The current administrative arrangement in Upper Volta has its roots in the French Colonial Administration which prevailed from 1896 until independence in 1960.

It is now divided into 10 Departments for territorial administration. There are Regional Development Offices (Organismes Regionaux des Developpements) in each department for promoting coordinated rural development programs. The first ORD was created in 1965. There are now 11 ORDs in the country. Even though the creation of ORDs is an indication of awareness of Voltaic authorities of the merits of instituting "bottom up" development strategies, the question regarding the adequacy of local involvement in the planning and overall development process leaves much to be desired.

The Eastern ORD region is the largest department in Upper Volta, comprising 18% of the land area and 7% of the

country's population. On the whole, the region is characterized by a heterogeneous agroclimatic condition, with different types of soils and varied levels of water availability. It has a Sudano-Sahelian climate with rainfall ranging from 600 mm in the north to 1,000 mm in the south. The average monthly temperature varies between 25 degrees centigrade in January to 31 degrees centigrade in April.

The cropping pattern follows the soil and rainfall conditions. Sorghum and Millet are the most widely grown food crops. Major cash crops are peanut, ground nut, sesame, rice, cowpeas and cotton.

The average area cultivated per household is estimated to be 7.09 hectares with average number of six working unit per households.

Population is concentrated in the western and southern and eastern portion of the Department, with a density ranging from a low of 2 to about 40 persons per sq. km.

The region is inhabited by three major ethnic groups: Gourmanche, Mossi, and Peul, all engaged in farming, livestock raising and various forms of off-farm activities.

The Eastern ORD is the organization responsible for rural development in the eastern Department. It was created in 1968 and got official status in 1974 about nine years after the creation of the first ORD in the country. Its goal, like all other ORDs, is to promote decentralization and

coordinated administration of development activities at the regional level. It also serves as a mechanism for channeling external assistance aimed at improving agricultural productivity and rural welfare. Having the extension service as its core, the EORD has attempted to deliver different services to the rural population with the objective of promoting integrated rural development in the region.

The EORD is administered by a Director and a local policy group called Assemblée Générale, which in turn elects a steering committee known as Comité de Direction. The ORD director reports to the steering committee as well as to the permanent Secretary in the Ministry of Rural Development. Presently, the EORD's headquarters is composed of six bureaus, each with various sections, and field offices at three different levels.

In 1972, the EORD had 79 employees and 28 million francs CFA personnel budget. This increased to 343 employees and 135 million francs CFA personnel budget in the 1979-80 fiscal period.

Perhaps due to the rapid growth in the number of employees, the EORD is often characterized by budgetary constraint, high maintenance cost, low quality staff, high staff turn over and overall inefficient management.

The EORD-IRDP was a major joint undertaking by USAID and the EORD. Its objective was to expand the Ord's administrative capacity and to increase agricultural production

and rural income in the Eastern Region. The project was designed with the intent to create "Centers of Progress" for intensive program of intervention, and thereby experiment on provision of concentrated extension and related supporting services. However, operational problems curtailed implementation of the concept. Consequently, ORD-wide applied research and limited implementation programs were undertaken by the Michigan State University technical assistance team from May 1977 until June 1981.



## CHAPTER IV

### THE ROLE OF THE EORD/IRDP IN INSTITUTION BUILDING, 1974-1981

#### Introduction

One of the most important objectives of the IRDP was institution building or the process of strengthening the operational and administrative capacity of the ORD to carry out its mandate. The means envisaged for achieving these objectives were the provision of technical assistance, training, improvement of roads, building and other infrastructure. While the provision of assistance to improve the infrastructure started in late 1974, technical assistance services were not started until May of 1977. The technical assistance team carried out studies of agricultural credit, production and marketing, and assistance in strengthening the agricultural credit and audio-visual services. The task performed by the long term technical advisors were often supplemented by assistance from short-term consultants.

The purpose of this chapter is to evaluate the role of foreign assistance in strengthening the capacity of the ORD to design and implement various programs over the 1974-1981 period. As suggested in Chapter II, institution building will be examined through such indicators as

numbers of ORD personnel trained, efficiency in coordinating services, loan repayment performance, etc. The production and income effects of the services such as agricultural credit will be analyzed in the next chapter.

## 2. Agricultural Credit

### 2.1. The Role of Agricultural Credit in the EORD/IRDP

The agricultural credit component<sup>1</sup> is, if not the single most significant factor, certainly one of the key components of the strategy to increase food production, food security and income of the people of the eastern region. It is quite apparent that the credit component has derived its significant role from the worldwide characterization associated with the idealized potential of credit programs. As Long (1976) pointed out:

In idealized form, the scenario for a public sector program of credit for small farmers goes as follows: the government or central bank loans money to an agricultural bank which in turn relends the funds either directly or through cooperatives to small farmers. The farmers use the funds to purchase productive inputs such as fertilizer, seeds, pesticides, etc. which are combined with family labor to produce more output. The additional output is sold and the proceeds are sufficient to repay the loan and leave the farmer better off. The payments received from the farmers by the agricultural bank are sufficient to regenerate lending capacity, to cover administrative costs and to pay the interest on the government loan. Such a program consumes no resources; the money committed simply constitutes a revolving fund. The loans are repaid and the interest charges are sufficient to cover costs and any defaults.

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<sup>1</sup>For a detailed discussion of credit programmes in Upper Volta in general, and the Eastern Region in particular, see Tapsoba (1981).

However, despite the potential of lowering the cost of capital (and hence the cost of production per unit) as well as alleviating farm cash flow, very few credit programs have been successful in the developing countries. Jones (1971) stresses that credit should not be considered in isolation, but rather viewed as it relates to other institutions which can significantly influence its performance. To be successful, not only should a credit program be linked to new technologies, but these technologies should be financially profitable to the farmer. Such a profitable package depends on a host of interdependent factors, among which the most important are price incentives, marketing, availability, timeliness of farm input, extension, and other support services (repair shops, veterinary care, etc.).

The literature on credit delineates the role of credit in augmenting output and income through an increase in yields obtained per unit of land and/or an increase in expansion of the area under cultivation. Based on this premise, there are three situations in which credit may be extended to achieve this objective:

- When no technology is available, and where the aim is to increase the use of existing factors of production;
- When there are relatively inexpensive innovations, and the goal is to use credit as a catalyst for the adoption of these innovations; and
- When the modern technology being promoted involves

capital requirements that surpass the investment capability of small farmers.

The credit component of the IRDP was based on two assumptions. First, it assumed that credit was needed so farmers could purchase the required agricultural inputs with special emphasis on animal traction. Second, it assumed that a government agency (ORD) was needed to distribute the credit to the farmers. From this perspective, a revolving fund was established within the National Development Bank (BND) to channel the funds through the EORD to local farmer associations (groupements villageois).

## 2.2. Brief Program Description

Two types of credit programs are in use in the Eastern ORD. The first type is designed to provide a short-term (one production season) credit to farmers. This entails delivery of production inputs in kind, such as seeds, fertilizers, pesticides, etc. Within this category are also other miscellaneous loans for small enterprises such as village shops, village pharmacies, cereal banks, etc. The second type of credit program provides medium-term credit for farmers with emphasis on animal traction packages. The medium term loan has a repayment period of four or five years. The typical medium term loan for a more or less complete animal traction package has a maximum term of four years for donkey equipment and five years for oxen-drawn equipment. In both cases there is a one-year grace period, but the

farmers may start repayment the first year if they choose to do so. All ORD credit is provided in kind except--until recently--the purchase of draft animals.

Each type of credit is provided under different terms. For instance, the interest rate for the short-term credit varies from item to item, averaging about 12 percent. In the miscellaneous group, the cereal bank loans are given at a rate of 8 percent. The medium-term credit was given at a 5.5 percent interest until the recent increase instituted by Caisse Nationale de Credit Agricole (CNCA).

The financial resources of the Eastern ORD's credit operations are derived from internal and external sources. The internal portion of credit funds comes from the ORD's own generated funds (marketing and other commercial activities), but mostly from the National Development Bank. The external source of credit is provided by bilateral and multilateral donors, as well as by a non-profit organization. USAID is the most important bilateral contributor<sup>1</sup>, followed by the French Caisse Centrale de Cooperation Economique (CCCE) and the Cooperation Technique Suisse (CTS). Multilateral institutions include the FAO, the UNDP Fond d'Equipement des Nations Unies (FENU), the Entente Fund, and the Fonds de Developpement Rural (FDR) of the World Bank. The only private non-profit organization

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<sup>1</sup>The Ministry of Rural Development's S  cr  tariat Permanent du Comit   de Coordination du Developpement Rural (CCDR) has been channeling USAID's money to various ORDS for credit purposes since 1975. The CCDR was replaced in 1980 by the General Secretariat.

involved in credit activities is the Association Francaise pour le Developpement International (AFDI).

Each of the various donors is interested in certain types of credit. For example, USAID and AFDI provide loanable funds for animal traction and village cereal banks. FAO, FENU and the Entente Fund provide credit for cereal banks; CCCE was providing both medium-term credit (animal traction) and short-term credit (fertilizers, pesticides, etc.); FDR engaged in short-term credit provisions to village groups for more specific agricultural activities, such as rice and vegetable production in irrigated schemes and lowlands; CCDF funds were used primarily for animal traction equipment.

### 2.3. Policies and Procedures

#### 2.3.1. Administrative Procedures

The procedure for extending and collecting the repayment of both the short- and medium-term credit involves various bureaus and/or sections and sub-sections, sector chiefs, sub-sector chiefs, and extension/credit agents. For instance, the Bureau of Community Development (BCD) is responsible for the approval, disbursement and collection of loans. This specific duty is assigned to the Credit and Rural Institutions Section, which is one of the four sections in BCD. The Bureau of Agricultural Production (BAP) is responsible for collecting orders for traction equipment and draft animals as requested by sector chiefs. The BAP is also responsible for distributing inputs and other

equipment, and for the training of draft animals, as well as providing technical assistance on animal feeding and care. Extension agents, with the support of the BAP, provide technical training to farmers so that they can properly use the new animal traction technology. The Bureau of Livestock and Veterinary Services (BLV) provides animal health care services.

In processing short-term credit disbursement, extension agents are required to start by completing two sets of forms. The first set is filled out in quadruplicate and supplies the following information:

- number of the borrower, which is the number on the village group membership card;
- unit credit price of the various inputs;
- down payment;
- balance due; and
- the date of input delivery.

The four copies are sent to different destinations: the white, pink, and yellow copies are sent to the sub-sector chief; the fourth copy remains with the borrower. The second form which the credit agent fills out consists of a summary statement of all credit transactions by borrower number and by village. This statement is sent to the sub-sector chief, along with the three copies of individual short-term credit forms. At the sub-sector level, the sub-sector chief fills out a summary statement form by extension unit, and keeps the yellow copies of the

individual short-term credit forms. At the sector level, the sector chief goes through basically the same process. At the end of this procedure, the credit office at the headquarters in Fada holds three separate sets of summary statements (by village, by extension unit, and by sub-sector) and a number of pink credit forms corresponding to the number of borrowers.

The procedure involved in providing medium-term loans is about the same as that of the short-term credit. For each farmer who is eligible for medium-term credit, the credit agent prepares an "individual medium-term credit card" (IMTCC). The information on this card includes:

- the source of the loan;
- the date of delivery of the credit items;
- the number of the farmer and the number of his village;
- a description of the items being purchased;
- the amount of the installments and their due dates;
- the total amount of the loan, including interest payments;
- the down payment, if any; and
- the signatures of both the president of the village group or the village chief<sup>1</sup> and of the credit agent.

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<sup>1</sup>For illiterate presidents of village groups or village chiefs, fingerprints are used as a substitute for signatures.



In collecting short-term loan repayments, the first step involves sending the white form to the extension/credit agents. When a farmer repays his loan, the extension/credit agent returns the white copy and a receipt to the farmer. The extension/credit agent transmits the green form and repayment funds to the sector chief through the sub-sector chief. Summary statements of repayments are prepared following the same procedural steps as were explained earlier. The sector chiefs prepare several loan repayment statements, which are handed over to the ORD cashier along with the repayment funds. One summary statement of repayment is sent to the Credit Office for control. The Credit Office prepares a monthly short-term credit situation for both loans and repayment received.

The oxen loan package is repaid in a five-year period with one year's grace: three equal installments of 20 percent and a final payment of 40 percent of the total loan. The loan for the donkey package is for four years, with a one-year grace period and equal repayments in years two, three, and four. All repayment figures are given in a credit manual issued by the Ministry of Rural Development and used by credit agents to fill out the various documents described above.

### 2.3.2. Eligibility for Loans

There are several stipulations governing the distribution of credit to the farmers. First, credit is distributed through farmers' organizations such as village

groups and/or village cooperatives. The village organization screens and endorses the application of individual farmers seeking credit. Individual farmers are required to pay a group membership fee. The membership fee payments are kept by the ORD in a separate account to repay arrears. The annual membership fee costs 200 CFA for a short-term loan. The medium-term fee costs 500 CFA, and is valid for five years.

The second condition is that no member of any farmers' organization is eligible for a loan if the arrears of his village group or cooperative exceed 10 percent for the preceding year. This restriction may be waived by the lending institution in cases of unusual circumstances such as a natural disaster (e.g., drought), death, or if the ORD failed to deliver the inputs or equipment on time.

The third and fourth conditions require the loan applicant to make a down payment of at least 10 percent of the total medium-term loan, and that each potential borrower commit himself to plant at least one-third of his acreage to cash crops.

The fifth criteria of eligibility for medium-term credit requires an assessment of the profitability of the farm business, as well as the credit carrying capacity of the farm.

In addition, those farmers who benefit from the animal credit program are required to subscribe to an animal insurance policy which is prepaid as part of the total credit

package. The insurance premium amounts to 750 CFA per year for one donkey and 3000 CFA a year for a pair of oxen.

Although there is no fixed asset, such as land, required as collateral in the EORD credit program, provisions are made to cover default risks in the following ways:

- village membership fees,
- insurance premiums,
- subscriptions of cooperative members,
- repossession of equipment and draft animals,
- the profitability of the farmers' operation, and
- peer group and social pressure on delinquent farmers.

#### 2.4. Performance of the Credit Program

The purpose of this subsection is to assess the performance of the EORD/IRDP credit program. Three items will be discussed: (1) amount loaned and persons served, (2) loan repayment performance, and (3) farmer understanding of the credit program. The cost of lending and borrowing will be examined in the next chapter, in connection with an analysis of the overall effectiveness of the EORD strategy.

##### 2.4.1. Amount Loaned and Persons Served

Table 4-1 presents the amount of money distributed, the number of loans, and persons served by the short- and medium-term credit program during the 1975-76 to 1980-81 period. As shown in the table, the 9,282 persons served during this period represents about 15.5 percent of the

TABLE 4-1  
AMOUNT LOANED, NUMBER OF LOANS AND PERSONS SERVED  
1975-76 to 1980-81

Item	1975-76 to 1980-81		April 1, 1980-March 31, 1981	
	Rural Credit Fund	USAID-Sub. Account	Rural Credit Fund	USAID-Sub. Account
Amount Loaned out	106.268.153	39.002.265	19.914.485	4.430.370
% Med. Term	81	91	82	99
No. of Loans Med. Term	1452	665	245	65
No. of persons Served Med. Term	2444	1098	303	92
% Short Term	19	9	18	1
No. of Loans Short Term	3391	21	697	1
No. of persons Served Short Term	6838	269	871	10
No. of Loans Total	4843	686	942	66
No. of persons Served Total	9282	1367	1174	102

60,000 families residing in the Eastern Region. This level of achievement is below the lower bounds of the targeted attainment level. As was indicated earlier, the revised project objective envisaged extending the services to 10-15,000 farms of the region by the end of the project.

Table 4-2 also shows the evolution of the medium-term credit program in the Eastern region for the 1975-76 to 1980-81 period. As shown in the table, the value of loans for both oxen and donkey traction has risen from about 837 thousand CFA in the 1975-76 period to about 20 million CFA in the 1980-81 period. The number of loans has risen from 20 to 245 during the same period.

#### 2.4.2. Loan Repayment Performance

The collection ratio is one useful measure of the repayment performance of a credit program. Other repayment measures include the percentage of the portfolio in arrears, proportion of borrowers meeting repayment obligations, repayment index, etc.

The collection ratio indicator is the ratio of the volume of loan collection to the volume of amount due. It is a comparison between the value of installments falling due and the actual volume of repayment. This ratio is conventionally computed for an accounting period (i.e., a month, a quarter, or a year). Mathematically the collection ratio is expressed as follows:

$$G_n = \frac{\sum C_n}{\sum S_n}$$

TABLE 4-2

NUMBER AND VALUE OF LOANS FOR OXEN AND DONKEY TRACTION IN THE EASTERN ORD  
1975-1980

Year	Oxen Traction		Donkey Traction		Total	
	Number of Loans	Value of Loans (CFA)	Number of Loans	Value of Loans (CFA)	Number of Loans	Value of Loans (CFA)
1975-76	20	836,860	0	0	20	836,860
1976-77	116	7,685,744	12	371,250	128	8,056,994
1977-78	389	30,339,675	202	5,385,225	591	35,724,900
1978-79	86	7,125,695	97	2,385,225	183	9,511,125
1979-80	106	9,705,995	152	4,671,485	258	14,377,480
1980-81					245	19,914,485
Total	717	55,693,969	463	12,813,390		

Source: EORD Credit Accounts and Tapsoba, 1981

where

$G_n$  = collection ratio for period  $n$  (expressed as a percentage)

$C_n$  = volume of repayments collected during period  $n$

$S_n$  = volume of installments matured in period  $n$

Table 4-3 indicates that the collection ratio<sup>1</sup> for both the short-term and medium-term credit has increased from 25 percent in 1976-77 to 37 percent in 1980-81. This resulted in an overall collection ratio of 32 percent for the 1976-77 through 1980-81 period. On the other side, the delinquency rate has declined from 75 percent in 1976-77 to 63 percent in the 1980-81 period, with an overall delinquency rate of 68 percent.

Thus, the loan repayment record in the EORD/IRDP has not been very encouraging. An overall delinquency rate of 68 percent is indeed unsatisfactory by most standards. The percentage of portfolio in arrears has also risen steadily from 2 percent in 1977 to 28 percent in 1980.

Much effort has been exerted over time to understand the causes and to improve the poor performance. For example,

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<sup>1</sup>The calculation of the collection ratios as well as the delinquency rates in Tables 4-3 and 4-4 include interest charges in both the numerator and denominator. It also contains repayments for arrears in the "amount paid" category.

TABLE 4-3

EORD/IRDP LOAN REPAYMENT PERFORMANCE  
(BY YEAR)

Year	Collection Ratio (Percent)	Delinquency Rate (Percent)
1976-77	25	75
1977-78	41	59
1978-79	32	68
1979-80	25	75
1980-81	37	63
Unweighted Average	32	68

Source: EORD Credit Accounts, 1981



a study in 1978<sup>1</sup> attempted to pinpoint the causes of loan repayment default in the ORD's credit program. The study revealed that 37 percent of the cases of delinquency were attributed to the farmers themselves, 37 percent to the credit institution (the ORD), and 26 percent were due to natural causes.

The survey revealed that the single most important reason for the delinquency is that a substantial number of farmers consider the loan from the ORD as a 'one-time deal.' Since no future loan is expected, there is no need to meet repayment obligations. An important reason why farmers repay private money lenders is the shame that delinquency entails: the survey revealed that evading a loan repayment to the ORD is not perceived as being as shameful or disgraceful as failing to meet loan obligations with a private lender. Also, the ORD's collection procedures are perceived as being "soft" as compared with the tougher methods used by private lenders to insure repayment.

Second, the survey also revealed that the ORD was responsible for 37 percent of all cases of delinquency. The overriding reason is administrative neglect. The 37 percent of the cases of delinquency attributed to the ORD were broken down to the following problems:

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<sup>1</sup>The findings of this study were summarized in Thomas Stickley & Edouard Tapsoba, "Loan Repayment Delinquency in the Eastern ORD of Upper Volta," in Borrowers and Lenders, edited by John Howell, Overseas Development Institute, London, 1980.

(1) 29 percent of the cases of delinquency were caused by the late delivery of animal traction equipment;

(2) 3 percent were due to the fact that the draft animals purchased were too young and too small;

(3) 3 percent were due to ORD credit agents dropping in unannounced to collect loan repayments without advance notice; and

(4) 2 percent were caused by the fact that the agent who went to collect the repayment money was different from the one who actually processed the loan--farmers were confused, and refused to repay an agent they did not already know.

Thirdly, the survey attributed 26 percent of all cases of delinquency to bad weather (especially drought), death and sickness of both farmers and draft animals.

In view of persistent poor performance, another attempt was made in 1981<sup>1</sup> to understand the causes of differences in repayment rates among the sectors. The diversity of the repayment level (see Table 4-4) portrayed by each sector is consistent with common knowledge about the heterogeneity of the agricultural condition (rainfall, soil type, farm size, crop mix, family size, etc.) in the eastern region. However, two different factors were repeatedly emphasized during the consultation as having contributed to success in Comin-Yanga and to poor performance in Diapaga sector.

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<sup>1</sup>See Negash, Progress Report no. 8 and End of Tour Report 1981.

TABLE 4-4  
EORD/IRDP LOAN REPAYMENT PERFORMANCE  
(by sector)  
March 31, 1981

Sector	Amount Expected	Amount Paid	Collection Ratio	Delinquency Rate
Bogande	7.058.928	2.697.681	38.2	61.8
Comin-yange	1.843.065	1.353.653	73.4	26.6
Diabo	11.188.401	4.257.569	38.1	61.9
Diapaga	10.391.968	2.097.979	20.2	79.8
Fada	6.873.176	2.794.275	40.7	59.3
Kantchari	6.339.498	2.028.060	32.0	68.0
Matiakoali	3.908.567	1.096.418	28.0	72.0
Pama	3.904.684	2.843.690	72.8	27.2
Direction	341.485	124.765	36.5	63.5
Total ORD	51.849.772	19.294.090	37.2	62.8

Source: EORD Credit Accounts, 1981

Further analysis of the loan portfolio to determine the size of the loan received by each borrower in Comin-Yanga and Diapaga sectors revealed the information in Table 4-5. As shown in the table, 32 percent of the borrowers received 5,000 CFA or more, while 49 percent of the borrowers acquired 2,000 CFA or less in the Comin-Yanga sector. The balance--19 and 36 percent of the borrowers in Comin-Yanga and Diapaga sectors, respectively--received between 2,000 and 5,000 CFA.

#### 2.4.3. Farmer Understanding of the Credit Program

As discussed in Chapter II, feedback on the farmers' perception and understanding of existing programs and practices may, in some cases, hold the key for introducing future improvements. With respect to agricultural credit, for example, it is quite essential that farmers understand the role of credit, the associated costs, and the terms of repayment. If they have a clear grasp of such points, then it becomes rational to expect them to fulfill their contractual obligations.

During the 1978-79 farm survey in the EORD, credit recipients were asked to answer some open-ended questions. The farmers' response to the question, "What was the purpose of the loan?" is summarized in Table 4-6. The response to other questions designed to test farmers' knowledge of the value of items purchased and farmers' perceptions of the length of time available for loan repayment are shown in Tables 4-7 and 4-8 respectively.

TABLE 4-5

SIZE OF LOAN IN COMIN-YANGA AND DIAPAGA SECTORS  
 (percent of borrowers receiving  
 that limit), 1980-81

Sector	Size of Loan in CFA	
	$\geq 5000$	$\leq 2000$
Comin-Yange	32%	49%
Diapaga	36%	28%

Source: EORD Credit Accounts, 1981

TABLE 4-6

EASTERN ORD: FARMERS' PERCEPTION OF THE PURPOSE OF LOAN, 1978-79

Purpose	Short Term		Medium Term	
	Number of Farmers	Percentage	Number of Farmers	Percentage
Increase production	18	40.9	53	62.2
Increase profit & revenue	10	22.7	4	5.0
Work better	1	2.3	17	21.3
To save own cash money	1	2.3	--	--
Improve fertility of land	10	22.7	--	--
Others	3	6.8	5	6.3
Do not know	1	2.3	1	1.2
Total	43	100	80	100.0

Source: Farm Survey Data and Tapsoba, 1981

TABLE 4-7  
EASTERN ORD: FARMERS' KNOWLEDGE OF THE CREDIT AND CASH VALUE  
OF PURCHASED ITEMS, 1978-79

Purchased with Short Term Credit				Animal Traction Equipment				
Credit Value		Cash Value		Credit Value		Cash Value		
No. of Farmers	%	No. of Farmers	%	No. of Farmers	%	No. of Farmers	%	
Valid Answer	17	36.2	12	25.5	18	19.8	10	10.9
Invalid answer	15	31.9	10	21.3	18	19.8	12	13.0
Don't know	15	31.9	25	53.2	55	60.4	70	76.1
Total	47	100	47	100	91	100	92	100.0

Source: Farm Survey Data and Tapsoba, 1981

TABLE 4-8

EASTERN ORD: FARMERS' PERCEPTIONS OF THE LENGTH OF TIME  
FOR REPAYMENT OF SHORT TERM LOANS, 1978-79

Time (in months)	Number of Farmers	Percentage
6	13	25.5
7	3	5.9
12	27	52.9
After harvest	5	9.8
Do not know	3	5.9
Total	51	100.0

Source: Farm Survey Data 1978-79



Table 4-6 indicates that over 60 percent of the farmers are aware that the most important purpose of the loan was to increase production and revenue, which is consistent with the production objective of the EORD/IRDP. Table 4-7 shows that about 36 percent knew the credit value of the inputs they obtained on credit, 32 percent gave a wrong figure, and 32 percent said they did not know. Furthermore, 25.5 percent knew the cash price of the seasonal inputs, but 53 percent said they just did not know. Similarly, about 20 percent of the farmers who obtained medium-term credit knew the value of their loan package, while about 60 percent did not. Moreover, only 11 percent knew the cash value of their equipment package, while 76 percent did not. Table 4-8 shows that 53 percent of the 51 short-term borrowers gave the right answer (i.e., twelve months), whereas about 31 percent thought they had six or seven months to repay their loans.

#### 2.5. Problems and Achievements

Beginning with its early phase, the EORD/IRDP credit system was faced with problems emanating from two levels: problems arising from the central administration of the ORD, and problems concerned with the operation of the system at the field level. At the headquarters level, the credit system was faced with a steadily eroding portfolio because some of the fund was used for covering general operational expenses of the ORD and rural saving program was not initiated to supply new sources of credit

from internal sources. This shortage of funds, however, was curtailed temporarily by new injections of capital from various foreign assistance programs.<sup>1</sup> Similarly, there were many problems at the field level when the credit program expanded. For instance, Stickley (1978) characterizes the initial stage of the credit system as follows:

- Lack of systematic, regular, and accurate record-keeping and reporting of loan distribution, loan repayment, and distribution of agricultural supplies.

- Low repayment rates of loans due to (a) the lack of a systematic loan collection system and (b) poorly motivated extension agents.

- Poorly-organized work plans for extension agents as they relate to loan disbursement and collection.

- Extension agents who delay (or avoid) forwarding to the Central Office money collected from farmers for loan repayments, cash sales of agricultural factors of production, payments associated with loan renewals (interest and insurance of traction animals), insurance premiums, the sale of membership cards, and down payments made when requesting a loan.

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<sup>1</sup>There were ten different international projects providing credit funds to the ORD as of March 31, 1981. AID has four: the Integrated Rural Development Project, the Entente Project, animal traction project (CCDR) and Strengthening Women's Role in Development (SWID). The United Nations had three: a World Bank project, FAO/UNDP, and an equipment project (FENU). France had two, the French Association for Industrial Development (AFDI) and the Central Bank for Economic Cooperation (CCCE); and the Swiss had one, Swiss Technical Cooperation (CTS).

These problems were thoroughly documented<sup>1</sup> through investigations carried out by the technical assistance team members in collaboration with the ORD personnel. Subsequently, various proposals have been made suggesting the implementation of new management procedures or requiring modification of existing operating practices.

One major step in this direction was the computerization of the credit management system. This system was designed to meet the following objectives:

- To produce regular, accurate, and rapid statistical reports on the number and amounts of loans and loan repayments broken down by ORD sector, by loan purpose, and by source of funding.

- To improve loan repayment rates.

- To improve the productivity of ORD employees.

- To improve the productivity of investments made with capital distributed through the agricultural credit system.

- To achieve viability of the agricultural credit system--that is, a self-supporting credit system in which revenues exceed the costs of operation.

When the implementation was completed, the system continued to produce three types of outputs: statistical reports, functional tools to aid extension/credit agents, and calculations of commissions to be paid to extension/credit agents based on loan repayments received.

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<sup>1</sup>For further details, see Stickley (1977); Barrett, et al. (1978); and Dahany et al. (1978).

The statistical reports produced included: number of loans made, number of persons benefitting from the loans, the amount of money loaned, amount of loan repayments received as a percentage of loan repayments due, number of delinquent borrowers as a percentage of all borrowers with loan repayments due, and a list of uncollectable loans to be written off. The statistics are broken down by fiscal year, sector of the ORD, factor of production (loan purpose), and source of funding.

The output produced to help the extension/credit agents to do their jobs more efficiently included: bills to borrowers, lists of such bills, lists of live loans, lists of overdue loans, lists of paid-off loans, lists of borrowers who were overcharged/undercharged interest according to the date repayments were made, loan repayment control sheets, monthly reports of loan payments received, and lists of borrower identification numbers already assigned.

A commission system was adopted in order to encourage and motivate extension/credit agents to write and collect more productive loans. The calculation of commission to be paid to the agents was processed by the computerized credit system.

To date, there has not been a systematic evaluation of the computerized credit system. However, indications are that the system has been very helpful in producing statistical reports, preparing individual reports to farmers,

reducing embezzlement, monitoring loan repayment status, etc.

Regular and accurate statistical reports of the number and amount of loans and loan repayments are produced by sector of the ORD, factor of production (loan purpose), and source of funding. The bills sent to each borrower remind him of the amount due to be repaid and the date it is due. Consequently, embezzlement by agents is controlled, due to the pressure put on the agents by borrowers who receive bills for loans they have already repaid.

In assessing the overall viability of the EORD/IRD credit program, it is essential to note two related points. First, as was cited in earlier pages, over 90 percent of the revolving fund was obtained from external sources over the 1974-80 period. Also, a substantial portion of the fund is being used to cover other operating expenses of the ORD.<sup>1</sup> Therefore, any attempt to improve the viability of the credit system requires an effort to mobilize internal saving, coupled with measures to increase revenues and reduce operating expenses of the ORD. Secondly, the existing

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<sup>1</sup>The balance in the rural credit account on March 31, 1980 was 32,705,373 FCFA. This is equal to the balance in the bank of 446,330 FCFA, plus the difference between the amount the ORD owes the Rural Credit Fund (94,528,011 Francs CFA) and the amount the Rural Credit Fund owes the ORD (62,268,968 Francs CFA) or 32,259,043 Francs CFA. The 32,259,043 Francs CFA that the ORD owes the Rural Credit Fund presents a liquidity deficit problem for the Rural Credit System. The ORD Director took action to prevent this situation from deteriorating further in January 1980. At that time he ordered the ORD cashier to transfer directly to the Rural Credit bank account any money coming to the ORD cashier which was for the repayment of loans.

accounting system<sup>1</sup> of the credit program is useful for tracing global cash flows as well as cash transfers between the ORD and the Rural Credit account. The system does not, however, allow one to prepare an income statement or a balance sheet to ascertain the viability or net worth status of the credit program. To produce such statements, it is essential among other things to: separate interest income from loan payments; take periodic inventory of stock items; delineate the grant from payable loans; and assess full cost of service delivery.

### 3. Agricultural Extension

#### 3.1. Organizational Framework

In the EORD, agricultural extension services are provided to farmers under the framework of the eight sectors (see Figure 3.3). Each sector has a sector head who reports directly to the ORD director. At the center (Fada level), the extension service is supported by six departments comprising various sections and subsections. At the field level, the sectors are divided into 24 subsectors. Each subsector is headed by a subsector chief. The task of the subsector chief includes training and supervising extension agents under his jurisdiction, as well as channeling the paperwork of the staff back and forth in the ORD system. Each extension agent is responsible for an extension unit (unite d'encadrement). There are 144 extension units

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<sup>1</sup>For further details see Negash, "Progress Report no. 8" and Negash, "End of Tour Report" (1981).

within the EORD system. The norms established for creating an extension unit states that there must be:

- five villages per extension unit (although this can vary from three to six villages),
- not more than 3,000 inhabitants in the five villages, and
- no village more than 20-25 kms. from the center of the unit.

Theoretically, each extension agent (encadreur) is responsible for the entire process by which farmers are exposed to, and adopt, technical themes and packages. His first task is to sensibilize the farmer to any theme or innovation which is to be expounded, or any input to be adopted. Once an individual farmer or group understands the innovation, his next task is to animate--to establish the necessary organization of structure for the adoption of the innovation. Thirdly, he must vulgarize, or expand the adoption of the innovation over a wider population or area. Finally, he must monitor the peasants who have adopted the package or innovation to ensure their proper use or handling of it. The total of these four tasks constitutes encadrement, and those who have been exposed successfully to the whole process are considered to be encadre.

In 1974, there were 24 extension agents in the whole ORD system. By the end of 1980, the number had increased to 149 extension agents. The various catagories

of extension agents and their levels of training are further assessed in Chapter V.

### 3.2. Delivery of Inputs

In order to obtain the technical input, a farmer will have to be a member of a village group (VG) in the area. Thus, after holding a few series of meetings on sensibilization, the extension agent is always under pressure to form as many VGs in his unit as possible. Briefly, the chain of qualification required of a farmer who wants to acquire inputs from the production package is a two-stage process: First of all, the farmer must be a member of a village group. Secondly, before the individual members of such a group can qualify for credit, the group must have met a series of basic requirements. The following are some of the criteria used in distinguishing strong and active groups from the less active ones:

- longevity of the group,
- stability of membership,
- cohesiveness of members,
- amount of money in the treasury,
- record of loan repayment,
- completion of successful projects, and
- full participation of all members in group activities and in decision-making.

According to the statistics on men's and women's village groups in the Eastern ORD many of the groups are considered to be not very active using the indicated



internal evaluation criteria. For instance, among the men's groups, 52 percent of the total were considered "not very active" in 1978. In 1980, the percentage of "not very active" groups had dropped to 50 percent, but the total number of men's groups had declined by about 13 percent from the 1978 level.

In 1978, 49 percent of the women's groups were considered "not very active." This increased to 67 percent in 1980. In both the men's and women's groups, it is only a negligible proportion of those regarded as "strong and active" who are operating viable self-help projects such as stores, pharmacies, grain mills and cereal banks. Consequently, numerous observers have registered concern about the role of village groups in promoting rural development in the region. For instance, Poulan, et al. (1978) writes that "the village groups are serving collective interests of the ORDs more than as a means to increase mass participation in the development of decision-making." Similarly, Swanson (1979) points out that "pre-cooperative groups being formed by ORD extension agents, for the most part, do not take the form of pre-existing local structure usually found within rural communities in the Eastern ORD."

The shortcomings of the input delivery mechanism is not limited to the formation of ineffective village groups; the delivery system is also inefficient in extending the traction animals and other technical facilities to farmers on time. To investigate the efficiency of the

Eastern ORD medium-term credit delivery system, a one-shot questionnaire was administered to 128 animal traction farmers (ANTRAC) in 1978-79 (Tapsoba, 1981). Farmers were asked whether they used their traction package the first year. Out of the 94 who receive credit from the ORD, 57 used their equipment the first year, 33 did not, and 4 did not answer the question (see also Table 4-9). The reasons why the 33 farmers did not use their equipment the first year include:

1. material was not delivered on time (34.4%),
2. animals were not trained (28.1%),
3. animals were too young (12.5%),
4. equipment was incomplete (6.3%), and
5. animals were not delivered on time (3.1%).

As was described earlier, a number of bureaus, sections, and subsections at the headquarters level are involved in the ORD's credit program. However, there is no precise schedule of the various tasks which have to be performed by different services at the headquarters and by extension workers at the sector level. There are, at best, vague guidelines indicating that lending activities would take place from January to September, with no clear deadline set for orders of needed equipment.

TABLE 4-9  
EASTERN ORD: REASONS WHY 32 FARMERS DID NOT USE ANIMAL TRACTION EQUIPMENT  
DURING THE FIRST YEAR, 1978-79

Reasons	Numbers of Farmers	Percentage
Equipment not delivered on time	11	34.4
Animals not trained	9	28.1
Animals too young	4	12.5
Incomplete equipment	2	6.3
Animals not delivered on time	1	3.1
Other reasons	5	15.6
Total	32	100.0

Source: Farm Survey Data and Tapsoba, 1981

### 3.3. The Training Activities of the EORD/IRDP Contract Team in the Extension System

After realizing the poor performance of the ORD extension system, the technical assistance team attempted to improve the operations of the extension program--especially during the latter portion of the team's tenure in the field--by organizing various on-the-job training activities for the extension agents and other ORD staff at different levels. The training activities were initiated either by individual specialists or through a collaborative team arrangement. For example, the training activities in the animal traction area were given to sector chiefs and sub-sector chiefs, extension agents, and farmers using prepared technical manuals.<sup>1</sup> The training covered the following subjects:

- the association of plant and animal production,
- the choice of traction animals (including a visit to the local herd),
- the health and nutrition of animals,
- shelter for the animals,
- animal training,
- proper adjustment and maintenance of animal traction equipment,

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<sup>1</sup>The livestock technician has written a technical manual for extension agents on the following subjects:

- a) the association of crop and animal production,
- b) the choice of traction animals,
- c) care and feeding of the animals, and
- d) animal training.

- practical demonstrations of the use of the equipment,
- a review of the different cultural practices which can be performed with the equipment, and
- a budget analysis of animal traction.

In training extension agents on the use of animal traction equipment, the livestock specialist covered the following areas:

- objectives and benefits of plowing;
- erosion control;
- presentation of equipment for plowing, and assembly of equipment;
- nomenclature of plow parts to facilitate the ordering of spare parts;
- adjustment of equipment to regulate depth and width of plowing;
- techniques of plowing; and
- a practical demonstration of plowing.

Using prepared technical manuals<sup>1</sup>, the training activity in agricultural credit also included the following topics:

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<sup>1</sup>Fiche Technique sur le Credit Rural, by Amidou Dahany & Thomas Stickley, Credit and Cooperatives Section, BDC, Eastern ORD, Fada N'Gourma, Upper Volta, March 1979. Comptabilite des Micro Projets (Banque Cereal, Beutique Villageoise, Moulin a Mill, Etc.), by Kifle Negash, Sinare Mousa & Dahany Amidou, BDC, EORD, Fada N'Gourma, Upper Volta, February 1981.

- credit policies currently in effect,
- loan guarantees,
- economic analysis of animal traction investment before loans are made,
- animal insurance,
- criteria for making the choice of village groups to receive group loans,
- accounting systems for village groups,
- credit renewal policies and procedures,
- commission payments to those collecting loans,
- handling accounts of borrowers who have died,
- proper use of the Medium-Term Credit Contract,
- calculating interest of those who pay before or after the exact due date of a loan, and
- credit to village groups for cereal banks.

The training method employed in the EORD is known as "cascade" training. This is theoretically a three-level training system. First a practical course is developed by central ORD personnel, the technical assistance team and their counterparts, who give it to middle-level personnel such as sector and sub-sector chiefs. They, in turn, present the material to the extension agents in their respective areas. Finally, the agents are expected to give the course to the farmers with whom they have worked. The farmer training given during the village group discussion days also follows the cascade principle. Selected village group representatives attend the meetings held every year

in each of the 24 sub-sectors of the EORD. The farmer representatives are supposed to share the information gained in the meeting with their membership at large upon returning to their respective villages.

However, the training of both draft animals and farmers has always been a serious problem in the ORD animal traction program. Extension/credit agents are often tied up with paperwork, and frequently there is not enough time to teach farmers how to use their equipment. In order to supplement farmer training by extension agents, a group of farmer "animal trainers" (bouviers) was employed. Their job was to train oxen and instruct farmers in the correct use of the technical package.

The use of animal trainers has been found to be quite helpful, even though the training sessions have imposed a serious problem. For example, Tapsoba (1981) recounts his experience as follows:

Bouvier may arrive in the village and find that the farmers did not have any advance notice, or, alternatively, the Bouvier does not show up. The latter case is commonplace because there is not a clear understanding as to who (the BAP or the sector) should provide transportation. Obviously, farmers who cannot use their young animals, the first year, incur a number of costs such as feeding, veterinary care and insurance costs, while no benefit is derived.

In view of the prevailing circumstances, there is a need to strengthen the training aspect of the EORD extension system. It is essential to improve the training activity not only on technical matters--such as plowing, weeding, and ridging techniques--but also on administrative

procedures, such as the presentation by the technical assistance team on the administration of rural credits. The focus and the detail of material coverage should rely on the type of prospective clients: farmers, new extension agents, refresher courses for agents in service, or specialist courses for specialist agents in the areas of crop production, livestock production, managing credit, etc.

#### 4. Product Marketing

##### 4.1. Objectives of the EORD Marketing Activities

The marketing operations of the EORD were aimed at achieving three principal objectives<sup>1</sup>: (a) encouraging increased crop production by the region's farmers through timely purchases at guaranteed minimum prices; (b) providing revenue to the ORD from sales activities so as to facilitate other ORD programme operations; and (c) providing some stabilization of seasonal price fluctuations in staple food prices.

The marketing specialist<sup>2</sup>, in collaboration with the other assistance team members, has attempted to assist in the realization of these objectives by suggesting and implementing action and research activities in the areas of

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<sup>1</sup>For details see Wilcock, Six Month Report, December 1977.

<sup>2</sup>The marketing specialist has also served as chief of the technical field team and the head of the BAEP. He assumed the latter responsibility during the first part of his contract period.



purchase and sale of crops, creation of village grain banks, and applied marketing research.<sup>1</sup>

#### 4.2. Purchase and Sale of Crops

In an attempt to achieve two of the stated objectives--encouraging increased production and generating revenue as a means of self-financing, the EORD was directly involved in the purchase, transport, and export of foodgrains. Table 4-10 shows the principal crops purchased in the 1974-75 EORD marketing campaign. According to the table, the ORD purchased about 2,300 MT of cereal and about 320 MT of peanuts and sesame for a sum of 64,871 million FCFA. In contrast with this campaign, the purchases in the 1977-78 period amounted to about 33 million FCFA of agricultural products. The cost of grain purchased during this period was 26,965,476 FCFA (see Wilcock, 1978).

As indicated earlier, the data base in the EORD has been weak at the initial phase of the EORD/IRDP. This, coupled with a poor communications network and inadequate record keeping, does not allow for a complete description of the ultimate fate of products purchased in various parts of the ORD. The following, however, are illustrative dispositions which are likely to occur in different

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<sup>1</sup>In addition to the marketing reports already written, a dissertation entitled A Socio-Economic Analysis of Farmers' Food Grain Marketing Linkages and Behavior in Eastern Upper Volta is to be completed by Ouedraogo in 1983.

TABLE 4-10

EASTERN ORD: METRIC TONS OF CROPS PURCHASED AND CFA PAID OUT  
BY SECTOR, 1974-75 CAMPAIGN

Crop	Sectors				Total <sup>1</sup> / ORD
	Fada I	Fada II	Bogande	Diapaga	
White Sorghum 2/ CFA (000)	MT 427.2 9,595	95.5 2,091	359.4 7,743	434.4 11,039	1,316.5 MT 30,449
Millet CFA (000)	MT 286.8 6,280	282.3 6,174	196.4 4,285	69.7 --	835.1 MT 16,738
Maize CFA (000)	MT 24.9 681	1.2 33	-- --	-- --	26.1 MT 714
Red Sorghum CFA (000)	MT 7.8 170	10.0 210	-- --	-- --	17.8 MT 380
Paddy Rice CFA (000)	MT 51.1 1,776	43.9 1,503	3.4 101	29.4 1,030	127.9 MT 4,411
Peanuts-Shelled CFA (000)	MT 29.8 1,135	-- --	175.9 7,651	-- --	205.6 MT 8,786
Peanuts-Unshelled CFA (000)	MT 34.6 887	7.5 181	42.2 1,208	-- --	84.3 MT 2,266
Sesame CFA (000)	MT 11.1 417	-- --	17.0 708	-- --	28.1 MT 1,125
Total CFA (000)	20,911	10,193	21,697	12,069	64,871

<sup>1</sup>/Certain totals do not add exactly due to rounding.  
<sup>2</sup>/CFA in thousands.

Source: Rapport Annuel 1974, ORD de l'Est Fada, Mai 1975; and ORD de l'Est Fada,  
"Campagne de Commercialisation, 1974-75: Situation Comptable".  
Eicher et al 1976

proportions (Eicher, et al., 1976):

- Storage in local facilities of varying adequacy, and local resale before the subsequent harvest.

- Timely bulking and evacuation by rented trucks before the rainy season.

- Storage in ad hoc facilities (e.g., houses, old administrative buildings, etc.), no evacuation, stocks go through rainy season with substantial spoilage.

- Temporary unprotected storage, no evacuation, grain totally spoilt.

At the background of all these possibilities, Table 4-11 presents an overview of ORD commercial sales as of December 1975. As indicated in the table, there are numerous buyers of the products. However, the ORD has not been paid for over 80 percent of the sorghum and millet it delivered. This situation has led the ORD into financial difficulties to the extent that the ORD failed to repay the National Bank of Development (NBD) in order to qualify for a seasonal credit for the 1975-76 period. Consequently, these financial difficulties had forced the ORD to temporarily discontinue its purchasing operations in general and to reduce the price of the newly introduced soybean crop by almost 50 percent, thereby reducing the trust of farmers in the operations of the ORD.

The establishment of a commercialization fund (CF) by USAID has reduced the magnitude of the financial difficulties in the ORD's marketing operation. Even then,

TABLE 4-11

## EASTERN ORD: DISPOSITION OF MAJOR 1975 PRODUCT SALES AS OF DECEMBER 1975

Product	Date	Buyer	Quantity	Unit Price	Total CFA	Disposition
Sorghum-Millet	4/15/75	World Food Program (PAM)	90.0 MT	30,000 CFA/MT	2,700,000	PAID
Sorghum-Millet	6/28/75	OSRO	235.3 MT	30,000 CFA/MT	7,059,000	PAID
Sorghum-Millet	5/ ?/75	Cereal Bank-Bilanga	18.8 MT	25,700 CFA/MT	483,000	PAID
Sorghum-Millet	6/23/75	OFNACER	351.5 MT	28,450 CFA/MT	10,000,175	NOT PAID <sup>1</sup>
Sorghum-Millet	9/23/75	OFNACER	488.4 MT	28,450 CFA/MT	13,894,980	NOT PAID <sup>1</sup>
Sorghum-Millet	9/21/75	Sous-Comite	145.0 MT	26,000 CFA/MT	3,770,000	NOT PAID <sup>1</sup>
Sorghum-Millet	?/ ?/75	Sous-Comite	600.0 MT	26,000 CFA/MT	15,600,000	To be delivered
Shelled Peanuts	6/25/75	Stabilization Board (Caisse Stabilisation)	211.52 MT	85,000 CFA/MT	17,979,200	PAID
Sesame	6/24/75	Contract	22.599 MT	99,000 CFA/MT	2,237,301	PAID

Source: Eastern ORD accounts. Eicher et al 1976

1) As of December 1975 the Eastern ORD had not received from OFNACER or the Sous-Comite 43,265,155 of the total 53,507,155 CFA it was due for grain sales. Note that one of these transactions, 600 MT of grain, was simply an obligation on the part of the Sous-Comite to purchase this amount and that the grain had not actually been delivered.

however--as Table 4-12 shows--the buying and selling operation of the three campaign periods was carried out at a total loss of 6,687,917 CFA for the 1977-78 to 1980-81 period. In addition to this loss, the ORD has utilized 11,858,838 CFA of commercialization fund cash to pay for ORD expenses. Also, an inventory of sacks owned by the CF valued at 6,875,000 CFA was reportedly sold to the National Cereals Office (OFNACER), but the transaction has not been recorded on the books of the Commercialization Fund.

The support costs usually imply purchase of needles, strings, payment for truck rentals, and bonus payments to grain buyers. During the 1974-75 campaign, for instance, the buying agents of the ORD included 76 multi-purpose rural development associations (groupements villageois), 138 special ad hoc committees formed to purchase agricultural products (comites villageois), 17 "4C" clubs, and 11 isolated intermediaries.

As shown in the tables, the ORD has gradually scaled down its marketing operations. During the 1981-82 period, the grain buying duty was assumed by OFNACER, relieving the ORD of the responsibility. However, the EORD has continued its involvement with the grain banks, based on the positive results of the village grain storage experiment carried out with EORD/IRDP demonstration funds.

TABLE 4-12  
COMMERCIALIZATION FUND  
ACTIVITY 4/1/77 TO 3/31/81

	Campaigns			
	77-78	78-79	79-80	80-81
Sales	<u>36,685,865</u>	<u>11,295,424</u>	<u>-0-</u>	<u>26,553,150</u>
				<u>74,534,439</u>
Cost of Sales:				
COGS Sacks	(2,441,500)	(3,182,700)	-0-	(5,403,000)
COGS Grain	(26,965,476)	(10,335,950)	-0-	(20,152,502)
Support Costs	(8,530,510)	(537,450)	-0-	(3,673,268)
Total Costs	<u>(37,937,485)</u>	<u>(14,056,100)</u>	<u>-0-</u>	<u>(29,228,770)</u>
				<u>(81,222,356)</u>
Profit (Loss)	(1,251,621)	(2,760,676)	-0-	(2,675,620)
				<u>(6,687,917)</u>

Source: USAID Report 1981

#### 4.3. Creation and Operation of Village Grain Banks

In a preliminary investigation, the technical assistance team found that the farmers in the Eastern region are faced with a serious cash flow problem at harvest time for such expenses as payment of debt, traditional ceremonies, taxes, etc. To meet these obligations, farmers sell their grain at the market while prices are quite low. Later, during the "hungry season" (the Soudre), farmers are obliged to buy back cereal grain to eat; paying very high prices, usually with money obtained at the time from the sale of green crops (vante en herbe) arrangement.

The cereal bank program was initiated in the EORD to overcome grain storage problems. As indicated in section 4.2. above, the first cereal bank in the EORD started with USAID/EORD/IRDP demonstration funds. It was started with three village groups in Piela, Tapoa, and Logobou, all in the Diapaga sector. The starting process basically involved granting of loans to the village groups at harvest time so they could buy cereal from their group members, store it until the hungry season when open market prices are high, and sell the grain back to their members at prices lower than the open market prices. These actions are expected to benefit farmers in three ways: First, at the time the farmer sells his cereal to his village group, he sells it at a price higher than the open market price just after the harvest.

Second, at the time the farmer buys cereal from his village group, he buys it at a price lower than the open market price during the hungry season.

Third, the profit made by the village group (from the price mark-up less costs) stays with the village group of which the farmer is a member, and the farmer has a voice in deciding how the profits of the village group will be used.

The first three village groups were given a total of 1,800,000 FCFA (i.e., 600,000 FCFA to each of the groups) at 8 percent interest during the 1977 harvest. In 1978, the program was enlarged to 16 village groups receiving loans through the ORD with funds originating with different development organizations. Subsequently, many cereal banks have been started in the region; some have used their own resources, without credit from the ORD. Table 4-13 presents data on cereal banks that are started with loans from the EORD. As shown in the table, the amount due for collection was 6,657,986 FCFA, of which 4,035,035 FCFA had been repaid by March 31, 1980--resulting in a collection ratio of about 60 percent.

#### 4.4. Agricultural Marketing Constraints in the EORD

The major problems of the agricultural marketing system in the Eastern region, particularly during the initial phase of the EORD/IRDP, has been very well discussed in the report by Eicher, et al. (1976). Many of these problems



TABLE 4-13

EORD: CEREAL BANK LOAN DISBURSEMENT AND REPAYMENT, 1977 AND 1978

Year of Harvest After Which Loan Was Given	Sector of the ORD	Sub- Sector	Village Group	Loan Amount (FCFA)	Interest Charged (FCFA)	Total Repaid By March 31, 1980 (FCFA)	Amount Not Yet Repaid By March 31, 1980 (FCFA)	Source Of Financing
1977	Bogande Diapaga	Piela Diapaga	Piela Tapoa	600,000	33,539	633,539		USAID
		Logobou	Logobou	600,000	32,153	632,153		USAID
		Diapaga	Tapoa	480,000	40,194	512,329	127,865	USAID
1978	Kantchari	Eotou	Boulel	180,000	15,474	495,474	0	CTS
			Diagorgou	200,000	10,288	162,000	28,288	AFDI
		Kantchari	Sakpani	200,000	12,379	52,460	160,419	AFDI
			Boudieri	80,000	9,420	207,800	1,620	AFDI
			Toussiegou	154,140	5,593	0	85,593	AFDI
	Diabo	Diabo	Kuliwoko	600,000	9,326	100,000	63,466	AFDI
		Tibga	Tampoudin	300,000	37,392	150,000	487,392	USAID
	Bogande	Coalla	Bourgou	157,850	8,091	308,091	0	USAID
		Liptougou	Samou	150,000	6,435	164,285	0	USAID
	Matiaacouali	Gayeri	Gayeri	600,000	8,055	78,904	79,151	USAID
		Matiaacouali	Yenkouali	350,000	38,970	480,000	158,970	USAID
			Oubirnou	150,000	22,510	58,000	314,510	USAID
	Pama	Ougarou	Yentiaabri	500,000	10,422	0	160,422	USAID
	Fada	Pama	Tindangou	200,000	32,636	0	532,636	USAID
		Fada	Kikideni	200,000	12,274	0	212,274	USAID
					10,345	0	210,345	FAO
TOTALS				6,301,990	355,996	4,035,035	2,622,951	
REPAYMENT RATE:	4,035,035 ÷ 6,657,986 = 60.6%							

Source: EORD Credit Account and Stickely, 1980

still limit the marketing operations in the region. For instance, the marketing activities in the Eastern region are highly influenced by policy decisions from the national level as the decisions are translated to the local level through the actions of the four parastatal organizations involved in agricultural marketing:

- OFNACER (Office Nationale des Cereal) has now assumed the total responsibility for maintaining cereal price stability and food security. It is engaged in policy formulation and implementation involving cereal purchase, storage, and resale.

- SOFITEX (Societe des Fibres et des Textiles) handles the marketing and export of crops such as cotton.

- CSPPA (Caisse de Stabilization de Prix des Produits Agricoles) is responsible for exporting groundnuts, sheanuts, and sesame.

- UVOCOM (Union Voltaique des Cooperatives Maraichaeires) handles the export of fruits and vegetables.

The extent of coordination among these parastatal organizations leaves much to be desired.

By limiting its involvement to cereal bank operations, the ORD has relieved itself of problems associated with the buying and selling of cereals. Nonetheless, the ORD's management effort in cereal banks faces numerous problems emanating from different angles (unstable prices, poor roads, lack of marketing information, poor extension systems, etc.). Some examples of the major problems in the cereal

bank operation include:

- In areas of surplus production, it was difficult to get the cereal in the bank moved to deficit areas because of difficulties in arranging transport from remote sections.

- In areas of deficit production, it was difficult to arrange to purchase cereal in remote areas and transport it into the deficit areas.

- When the loan money arrived too late after the harvest, the full amount of the loan could not be spent because they could not find cereal to buy.

- Some village groups which had no donkey carts or other means of transporting cereal had difficulty getting the cereal from the seller to the storage place of the village group.

- Some village groups distributed funds for buying cereal among their members, but then had difficulty controlling this money and getting back either the money or the cereal.

The lack of information on the whole agricultural marketing system in the region has been dealt with, to some extent, through the applied marketing research effort of the EORD/IRDP. At the end of the project, data were collected on the various aspects of marketing activity. For instance, on improving the marketability of certain agricultural products in the region, the preliminary data analysis indicates the advisability of pursuing further

investigation on the processing<sup>1</sup> of shea butter and peanut oil extraction, soumbala production, rice processing, grain milling, etc. A specific proposal has been formulated<sup>2</sup>, as a first step in this process, to investigate rice processing and millet and sorghum milling activities.

Underlying the problem of fund control is the lack of a proper accounting and management procedure. Most of the cereal banks, as well as village group-owned microprojects such as grain mills, small shops, etc., lack methods of controlling stocks of material and the treasury of the group. There are no mechanisms to show the volume of business, available revenue, or the various types of business expenses. At a later stage of the project, an accounting and reporting format was developed<sup>3</sup> to assist both the credit agent and the respective owners of the enterprises in comprehending and monitoring the state of the business. The document has been adopted by the ORD's credit section for regular use in the future.

Other relevant questions regarding, for instance, the

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<sup>1</sup>Rural Small Scale Enterprises in Eastern Upper Volta, by David Wilcock, January 1981.

<sup>2</sup>An Economic Analysis of Sorghum/Millet Milling and Rice Processing Technology in the EORD, by Kifle Negash, March 1981. The proposal has been accepted by both EORD and AID/Ouagadougou, but has not been completed due to unexpected budget cuts.

<sup>3</sup>Comptabilite des Micro Projets, by Kifle Negash, et al., February 1981.

impact of the public sector activities on the private traders' actions, linkages between farmers and traders, and farmers' understanding of their marketing problems are being analyzed by Ouedraogo<sup>1</sup>.

## 5. Socio-Economic Research

### 5.1. Objectives of the Research Component

The overall objective of the applied research component was to generate socio-economic data, both at the farm and the community level. While the ORD's targeted use for the data was to make a coordinated input into the national 1982-86 five-year plan, there were also two other underlying purposes to the data generation effort. First, the research was to provide data for evaluating the costs and returns of the animal traction (ANTRAC) program of the EORD/IRDP. Secondly, the baseline information on the costs, returns, and overall productivity of the farming system is envisaged as a first step in the process of establishing an on-going data gathering and evaluation system within the EORD framework.

In order to achieve these objectives, the technical assistance team, under the leadership of the production economist and in collaboration with the staff of the EORD, has been engaged in the preparation, execution, and analysis of the socio-economic survey.

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<sup>1</sup>A Socio-Economic Analysis of Farmers' Food Grain Marketing Linkages and Behavior in Eastern Upper Volta, forthcoming Ph.D. dissertation by Ismael Ouedraogo, 1983.

## 5.2. Types of Data Collected

At the outset, four general types of data collection activities were identified to provide the information needed for achievement of the specified purposes. Mehretu (1978)<sup>1</sup> outlined the specific details of the elements in the following four data categories:

Review of existing data and analysis of them so that a general understanding of the problems of the region and data gaps could be identified. Such a process could help in a preliminary exercise of goal setting for development.

Baseline surveys for primary, census-type data and stock information of resources. This type of data collection affords a maximum possible coverage of the region, and its purpose would be to gather important development indicators and constraints. Baseline surveys will assist in identifying regions and sectors and will help define objectives which must then be studied in a more detailed fashion.

Farm-level micro-socio-economic research. In an environment where the major source of sustenance is primary activity based on agriculture, this research exercise provides in-depth understanding of the productive factors and how they are organized at the farm level. The data from such surveys enables the development of appropriate designs for rural development interventions as well as evaluating the impact of new technology and cultural practices on development goals (output growth and/or improvement of levels of living).

Specialized studies of important sub-set characteristics of the rural economy. Such study needs may emerge as a residual when the above studies pick up important phenomena in development problems. Sometimes they are deliberately set aside for specialized investigation.

Following this specification, a year-long farm level micro-economic survey was carried out during the

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<sup>1</sup>Assefa Mehretu, Regional Planning for Rural Development in the Eastern ORD of Upper Volta: Consultant's Report, Department of Agricultural Economics, MSU, March 1978.

1978-79 crop season. The survey involved 480 farm households living in twenty-seven villages located in 12 agro-climatic zones<sup>1</sup> distributed across the entire region. Table 4-14 presents the distribution of the households by agro-climatic zones.

The types of data collected in the survey covered the following general areas:

- inventory of material and human resources
- crop production and marketing
- livestock production and marketing
- animal traction
- off-farm and non-agricultural activities
- formal and informal credits.

Various questionnaires were designed under each of the categories for gathering the required information. The final list of questionnaires used in the 1978-79 farm level survey is presented as Appendix 5.

The farm level survey data has also been supplemented with secondary data and other special surveys. For instance, a rice farming system survey<sup>2</sup> has been undertaken to determine the economics of lowland (bas fond) rice farming in the eastern region. Other studies have also been carried out under the general category of the regional planning framework:

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<sup>1</sup>The different ecological zones were previously established by an FAO agronomist. J. Denis, Determination de Zones Homogenes en Vue de l'Installation d'un Reseau d'Essais Multilocaux.

<sup>2</sup>See Fotzo, Preliminary Results, March 1981; and forthcoming dissertation, 1983.

TABLE 4-14

DISTRIBUTION OF THE 480 SAMPLE AGRICULTURAL HOUSEHOLDS BY  
AGROCLIMATIC ZONE, VILLAGE AND SUB-SAMPLE, 1978-79

Zone	Village	Number of Households in Each Village or Region	
		Traditional	Animal Traction
Bogande	Gbanlamba	18	-
	Komboassi	18	-
Mani	Lanyabidi	18 <sup>a</sup>	-
	Bonbonyenga	18	-
Piela	Dabesma	18	-
	Piela	-	18
Diablo	Monkontore	18	-
	Lantaogo	-	18
	Diabo I	-	17
	Diabo II	-	18
Logobou	Namponkore	18 <sup>a</sup>	-
	Kindikombou	18 <sup>a</sup>	-
	Logobou	-	18
Partiaga	Bomondi	18	-
	Dubcaali	18	-
Yonde	Ouobgo	17	-
	Kondogo	18 <sup>a</sup>	-
Diapangou	Tilonti	18	-
	Diapangou	-	18
Botou <sup>b</sup>	Botou <sup>b</sup>	18 <sup>a</sup>	-
	Ougarou <sup>b</sup>	19 <sup>a</sup>	-
Kantchari	Mantchangou	17	-
	Moadagou	18	-
Ougarou	Poniokonli	18	-
	Ougarou	-	18
Pama	Tindangou	16	-
	Kpajali	16	-
Total		355	125

<sup>a</sup>village chief included as a non-randomly selected household head.

<sup>b</sup>North of Fada

Source: Farm Survey Data, 1978-79



- A village-level "socio-economic inventory" questionnaire was administered in all villages of the region; and

- The "Phase I" and "Phase II" questionnaires of a small enterprise survey was administered in a sample of the region's villages.

The socio-economic inventory, part of the Eastern ORD's regional planning program, collected data on (among other things) the presence/absence and number of different types of small-scale industries in each of the 645 villages in the region.<sup>1</sup> The small-scale enterprise survey was conducted in a sample of 192 villages. The "Phase I" questionnaire recorded very basic information for the maximum number of enterprises: number of employees, type of work space, and use of machinery. The "Phase II" questionnaire was used to record more complete information on entrepreneur characteristics, financial, and management practices of available enterprise owners. Table 4-15 contains a breakdown of the enterprises counted in the village inventory and sampled in the small-scale survey by eight enterprise groups and 25 specific enterprise types.<sup>2</sup>

### 5.3. Data Processing to Date

The initial data processing task for the 1978-79 farm survey was carried out at the computer center in

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<sup>1</sup>For a detailed presentation of the results of this inventory, see Mehretu (1981) and Wilcock (1981).

<sup>2</sup>For a detailed presentation of the data-gathering methods and additional details, see Wilcock (1981).

TABLE 4-15

NUMBER AND PERCENT DISTRIBUTION OF ENTERPRISES COUNTED IN VILLAGE INVENTORY AND  
SAMPLED IN SMALL SCALE SURVEY BY ENTERPRISE TYPE

Enterprise Group	Enterprise Type	Number of Enterprises		Small Scale Survey as Percent of Total		
		Village Inventory	Small Scale Survey		Phase I	Phase II
			Phase I	Phase II		
A. Metalwork	1. Blacksmithing	407 <sup>a</sup>	131	101	32%	25%
	2. Welding	-	14	14	-	-
B. Crafts	3. Carpentry	35	8	8	23	23
	4. Pottery	1,126 <sup>a</sup>	84	72	7	6
	5. Leatherwork	-	45	33	-	-
C. Clothing	6. Tailoring	428	119	103	28	24
	7. Weaving	2,499	137	38	5	2
	8. Cloth Dying	599	95	82	16	14
D. Repairs	9. Motorbike	89 <sup>a</sup>	28	25	31	28
	10. Radio	a	14	14	-	-
E. Food Processing	11. Grain Milling	105	43	42	41	40
	12. Baking	68	25	23	37	34
F. Agricultural Processing	13. Dolo Making	1,581	196	<sup>b</sup>	12	-
	14. Peanut Oil	428	34	<sup>b</sup>	8	-
	15. Shea Butter	2,212	23	<sup>b</sup>	1	-
	16. Soumbala	1,560	111	<sup>b</sup>	7	-

TABLE 4-15--Continued

Enterprise Group	Enterprise Type	Number of Enterprises					Small Scale Survey as Percent of Total	
		Village Inventory	Small Scale Survey		Phase II	Phase I	Phase II	Phase I
			Phase I	Phase II				
G. Retail Distribution	17. Gas Stations	<sup>a</sup>	3	3	-	-	-	-
	18. Gas Selling	<sup>a</sup>	46	43	-	-	-	-
	19. Pharmacies	33	7	7	21	21	21	21
	20. General Stores	208	54	52	26	26	25	25
H. Other Services	21. Bars	181	49	48	27	27	27	27
	22. Restaurants	165	55	50	33	33	30	30
	23. Coffee Stands	42	31	26	74	74	62	62
	24. Photographers	11	3	3	27	27	27	27
	25. Barbers	46	6	6	13	13	13	13
TOTALS		11,823	1,358	793	10%	10%	11%	11%

Sources: Village Inventory and Small Scale Enterprise Surveys and Wilcock, 1981

<sup>a</sup>These enterprise types were not counted in the village inventory.

<sup>b</sup>These enterprise types were excluded from the Phase II portion of the small scale survey.

<sup>c</sup>Percentages for totals calculated only for relevant categories.

Ouagadougou (CENATRIN). Though serious delays were encountered in the process, much of the editing, aggregation of files, and compilation and reporting of preliminary results took place from CENATRIN. The files were then brought to Michigan State University for further cataloging and documentation at the MSU Computer Center. The entire data set, which consists of 88 basic data files aggregated into 6 master files, is now available at both the MSU Computer Center and CENATRIN. The CENATRIN data base is accessible to interested users with authorization from the EORD director.

Presently, many reports have been produced that can provide detailed information on the rural economy of Eastern Upper Volta, on a wide range of topics: farming systems, agricultural credit, animal traction, agricultural marketing, small-scale enterprises, regional planning, etc. (See Wilcock, 1981 for the list of reports and documents produced as of 1981).

#### 5.4. Achievements and Limitations

The applied research effort of the technical assistance team was exerted on two fronts. First, the attempt was geared towards improving the functioning of the implementation program. As was pointed out earlier, the initial efforts of the respective technicians have been to fully understand the nature of the problem within the framework of the EORD's program. Many of the activities

outlined under each of the EORD/IRD service components were undertaken based on preliminary findings of the initial research efforts. The more comprehensive data collection efforts at both the farm and community levels had multiple objectives, among which was the creation of a knowledge base that could facilitate better understanding of the limitations and potentials of the region's rural economy.

At the end of the project a substantial farm level data base had been generated to describe the characteristics of the farming system; this can as well serve as a solid information source in evaluating and planning alternative investment options in the region. The implications of the findings, particularly as they pertain to the animal traction program, will be discussed in the next chapter.

Also, basic information is now available on the composition and characteristics of the rural small-scale enterprises of the Eastern region. Nevertheless, more work needs to be done in this area, most importantly to investigate the costs and returns associated with the prevailing practices in the production and marketing of outputs of the priority enterprises.

The data-gathering effort has also given Voltaics the opportunity to acquire different types of training. For instance, two Voltaics have participated in the data-gathering activity in the field: one as an MSC, and the other as a Ph.D.-level student in the MSU Department of Agricultural Economics. Their final output is listed

among the reports and documents of the project. Furthermore, over 14 medium- to lower-level ORD personnel<sup>1</sup> have received on-the-job training in the areas of data collection and data processing. As was cited earlier, the computer center in Ouagadougou was able to acquire its first experience in farm level data processing.

The technical assistance team has also exerted some effort to institutionalize research activity in the EORD system. An attempt was made to strengthen the applied research section of the BAEP by giving it a clear sense of direction, defining its area of intervention and its relation to national and international research organizations. First, the need to follow the farming systems approach has been strongly recommended to the EORD, so that the applied research section can engage in both technology assessment and data gathering aimed at permitting problems to be diagnosed at an early stage, and in putting suggestions forward to eliminate bottle-necks in carrying out project management duties.

One major shortcoming of the applied research activity resulted from the absence of an agronomist to participate in the research program. Even though the project design envisaged full participation of a UNDP/FAO

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<sup>1</sup>Due to budget limitations, however, almost all enumerators were fired by the EORD; the first group in June 1980, and the next in February 1981. Those who wished to return and stay with the EORD were sent for extension re-training to a training center (Martourkou). Upon their return they are to be assigned as extension agents, to be drawn to field research activities when funding permits BAEP research section reorganization.

agronomist in the research activity, the participation of the agronomist was constrained at two levels. First, the agronomist had a limited orientation toward farmer assessment research approaches; secondly, a budget cut in the UNDP/FAO further restricted the work of the agronomist to testing and developing improvements in crop production, such as improved tillage practices, soil erosion control, soil fertility improvement, new seed varieties, fertilizer application, insecticides, etc. Although some such activities were attempted by the animal traction and production specialists, the primary focus of the EORD/IRDP applied research program was the collection of the socio-economic baseline data.

## 6. Summary

This chapter highlights the achievement and limitations of the EORD/IRDP service components--agricultural credit, agricultural extension, product marketing and socio-economic studies over the 1974 to 1981 period.

The credit program, comprising short-term and medium-term credit, is the centerpiece of the various programs undertaken to expand food production, food security, and farm incomes in the Eastern Region. Credit is primarily used to purchase donkeys, oxen and animal traction equipment. The average interest rate for short-term credit is about 12 percent and 5.5 for the medium-term loans until it was increased to 11 percent in late 1980. The oxen loan package is to be repaid over a five-year period as follows: year

one grace period; equal installments of 20 percent in years two, three and four and a 40 percent payment in year five. The donkey package is given for four years, with a one-year grace period and equal repayments in years two, three, and four. There are several stipulations, such as down payment requirements, profitability of operations, group membership requirements, etc., governing the distribution of credit to the farmers. Over the 1975/76-1980/81 period, a total of 4843 loans were extended to 9282 families, or about 15.5 percent of the families in the Eastern Region. Despite a major extension program to encourage repayment of loans, the average loan repayment rate was only 32 percent during the 1976/77-1980/81 period.

The poor performance of the credit program is linked to a number of technical and administrative problems. The lack of a viable technical package is the Achilles' Heel of the EORD's credit program. Even the relatively larger farmers adopting the animal traction program experienced a severe cash-flow problem. Among the achievements of the credit program is the development of a rural credit account to facilitate proper accounting of cash flow, and initiation of management procedures capable of producing statistical data useful in improving the management process. Nonetheless, there is still a great need to refine the accounting procedure so that an income statement and a balance sheet can be prepared to ascertain the viability and/or net worth of the credit program periodically. In the final analysis, however,



development of a self-sustaining rural credit program in the EORD entails initiating and carrying out an effective saving mobilization activity.

The agricultural extension system of the EORD has grown from 47 field agents in 1974 to 171 in 1980. But the extension network is characterized as a one-way system, devoted to transmitting the available technical package to the farmer. It lacks a systematic feedback mechanism for incorporating problems of farmers into the design of research programs. The input delivery system is weakened by the formulation of an increasing number of ineffective village groups. Furthermore, the input delivery mechanism is incapable of extending a complete set of the needed technical package to the right place at the right time. The technical assistance team attempted to improve the operation of the extension program by organizing various on-the-job training activities for the extension agents and other ORD staff at different levels. The training activity was focused both on technical matters such as plowing, weeding, and ridging techniques and on administration of rural credit. Despite the obvious need to accelerate the training activities, the project leaders from both the ORD and the donors' side did not place the emphasis on the training of personnel. For example, in the 1976-1981 period, only 10 percent of the allocation for training was expended, because of limitations on timely identification of viable candidates as well as

failure to schedule the necessary logistical arrangements.

The marketing operations of the EORD/IRDP were initially focused on the purchase and sale of crops. It is indicated that this activity was carried out during the 1977/78 to 1980/81 period at a financial loss to the EORD. Thus, the intent to generate revenue for the ORD from the commercialization activity has not materialized. Consequently, the EORD has gradually relieved itself of the crop purchasing and selling activity. However, the ORD has continued its involvement with grain banks even though the management of cereal banks faces various problems. The rate of repayment, although better than animal traction credit rates, averaged only about 60 percent during the 1978-1980 period. Some limitations of cereal bank management in the EORD include poor transportation facilities, inadequate stocking capacity, unstable prices, lack of market information, a poor extension network, etc.

The socio-economic study has generated a vast amount of data covering various areas. The type of data collected includes:

- inventory of material and human resources
- crop production and marketing
- livestock production and marketing
- animal traction
- off-farm and non-agricultural activity, and
- formal and informal credit.

Over the 1978-1981 period, 72 reports have been produced, covering a wide range of topics: agricultural credit, farming systems, agricultural marketing, regional planning, small-scale enterprises, etc. (A lot of raw data remains in the computer files, still waiting to be analyzed.) These various reports have well described the structure of the EORD rural economy, identified outstanding problems, and in some cases suggested likely options for resolving a particular problem.

As indicated in Appendix 6, the achievement of the infrastructural objective of the EORD/IRDP has been more or less exemplified during the life of the project through the construction of offices, warehouses, animal traction equipment assembly plants, and the provision of office equipment, tools, operating funds, purchase of vehicles, etc. However, full development and subsequent realization of the anticipated benefits of the other institution-building project components will indeed require a longer period than the horizon stipulated within the 1974 to 1981 period.

## CHAPTER V

### THE IMPACT OF THE EORD/IRDP ON AGRICULTURAL PRODUCTION

#### 1. Introduction

The purpose of this chapter is to assess available empirical evidence on the impact of the IRDP activities on agricultural production and farm income. The main issue addressed is the role of animal traction<sup>1</sup> in helping small farmers in the Eastern region. The results of a major farm level survey in 1978/79 will be analyzed to assess the acreage, yield, and income effects. The costs and returns of production with donkey and oxen animal traction will shed evidence on the profitability of ANTRAC, the rate of adoption and the availability of net cash revenue over time to cover recurrent expenditures and repay loans on schedule. The introductory portion of the chapter also assesses the role of the EORD in promoting agricultural development, with special emphasis on planning and implementing its agricultural production and marketing programs. We conclude with an overall assessment of the viability of the technical packages which extension agents recommend to farmers in the EORD.

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<sup>1</sup>The Animal Traction Package comprised the main strategy of IRDP for increasing output and income in the EORD.

## 2. Role of the EORD in Promoting Agricultural Development

The redefining of the role of ORDS, in 1975, as agencies of integrated rural development brought additional responsibility to the EORD. Aside from the specific duties outlined in Chapter III, the new mandate required the EORD system to create regional development plans and coordinate development activities (agriculture, feeder roads, education, health, water supplies, etc.). This additional responsibility, however, was given to the ORD without enhancing the ORDs' organizational and budgetary capability for shouldering and carrying out the new mandate.

### 2.1. EORD Organizational Arrangement and Staffing

As shown in Figure 3.1, the EORD is linked to the ministry of rural development (MDR). As an autonomous regional agency, its director is appointed by the government's council of ministers and reports to the minister of rural development. Its headquarters in Fada is composed of six bureaus (departments), each with specific sections and subsections designed to facilitate the functioning of the existing programs of agricultural production and marketing.

There were about 93 ORD employees in 1974. The number of employees had expanded to about 400 in 1980. The number of employees and their level of training in the various positions within the extension system, are shown in Table 5.1 for the 1974 and 1980 periods. One conspicuous difference between the two periods is marked by an increase

TABLE 5.1  
POSITIONS WITHIN THE AGRICULTURAL EXTENSION SYSTEM

	Category	Level of Training	Number		Job Responsibility
			1974	1980	
Ingenieur Agronome (IA)	A <sub>2</sub>	B.A.C. <sup>a/</sup> +5 yrs.	0	5	ORD Director/ Service Chief
Ingenieur de Developpement Rural (IDR)	A <sub>1</sub>	B.A.C. +5 yrs.	0	0	"
Ingenieur de Travaux Agricoles (ITA)	A <sub>1</sub>	B.A.C. +4 yrs.	2	1	"
Conducteur de Travaux Agricoles Specialises (CTAS)	B	B.E.P. <sup>b/</sup> +3 yrs.	5	5	Sector Chief
Agent Technique Agricole Specialise (ATAS)	C	C.E.P.E. <sup>c/</sup> +4 yrs.	36	24	Sub-sector Chief
Encadreur	Not classified	C.E.P.E. +9 months	47	171	Field level Extension Agent

Notes: a) Baccalaureat--Secondary school completion certificate  
b) Brevet--certificate received after two years of secondary school  
c) Primary school completion certificates

Source: Compiled from various EORD project documents, 1972-1981

in the number of personnel. From none in 1974, the number of Ingenieur Agronome has increased to 5 in 1980. However, most of them possessed only a limited work experience. The greatest personnel increase occurred among field extension agents. As will be discussed later, this group contains personnel of very low-level formal training as well as little, if any, practical training. During the same period, the farm family/extension agent ratio has changed from 1:1600 in 1974 to 1:319 in 1980.

The budget for EORD comes from internal and external sources. The internal source is accounted for on two lines. One is funding from the government, which covers salaries and allowances for permanent civil servants working in the ORD. The second source is an ORD budget covering salaries and allowances for contract employees, operation and capital expenditures. The external source is composed of funding from various donor agencies covering different expenditure categories, including rural credit loan allocations. Table 5.2 shows the distribution of the ORD's budget for 1972, and from 1977 to 1980, by expenditure category. As reported earlier, external funding constitutes the most important part of the EORD's budget. For instance, in the 1977-78 period, external funding accounted for 70.2 percent of the total budget. The external funding increased to 85.1 percent in the 1979-80 period.

Since its official establishment in 1974, the EORD has concentrated on expanding the number of extension

TABLE 5.2

## THE EASTERN ORD BUDGET FOR 1972 AND FROM 1977 TO 1980 (in CFA)

	1972 <sup>a</sup>	1977/78	1978/79	1979/80
Total Budget	70,000,000	410,801,971	394,246,936	797,207,741 <sup>b</sup>
1. <u>Investments</u>	---	234,697,039	149,457,000	489,036,000
1. Buildings	---	135,587,039	89,916,000	318,750,000
2. Vehicles & tractors	---	52,800,000	---	---
3. Equipment	---	46,310,000	59,541,000	170,286,000
II. <u>Operating Expenses</u>		176,104,932	226,119,936	195,688,341
1. Vehicle operating expenses	---	42,175,000	54,518,000	22,889,119
2. General operating expenses	---	27,280,000	32,979,400	28,482,160
3. Personnel expenses:	28,000,000	106,649,932	138,622,536	144,317,062
Extension/credit agents		66,326,057	83,201,610	78,627,652
Others		---	18,670,000	---

<sup>a</sup>This figure is for a fiscal year: April 1 to March 30<sup>b</sup>This figure includes funds for credit and other expenses for 112,482,700 CFASource: ORD d 1'Est, Budget 1977; Projet de Budget 1978; Projet de Budget de l'exercice 79-80



agents in order to facilitate increased agricultural production.<sup>1</sup> But, overall performance in many respects has not been as expected. For instance, the new mandate of the ORDs--to execute multi-sectoral functions as well as coordinate the activities of national departments and ministries other than rural development--was evaluated by a government commission in 1980. The commission's findings were that most ORDs, including the EORD, did not have the capacity to implement--or even coordinate--activities outside of agriculture. The commission then recommended that their mandate be limited to agricultural development. The commission also proposed that an economic and social coordinating committee be set up at the departmental level, headed by the perfect (World Bank, 1982). Likewise, recent research findings<sup>2</sup> indicate that the general farming system of the EORD is still characterized by low productivity and a low level of monetization. The specific factors associated with these two characteristics will be examined in the following subsection.

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<sup>1</sup>The specification of the conceptual framework for regional planning and the collection of regional planning data in the EORD/IRDP research program was an attempt to satisfy the new regional planning mandate imposed on the EORD in 1975.

<sup>2</sup>Presented in various EORD/IRDP research reports.

## 2.2. Programs of Agricultural Production and Marketing

The EORD has been involved<sup>1</sup> in a large-scale effort to promote the use of animal traction for increasing dryland agricultural production since its formal establishment in 1974. The traction technology is also used in bottom lands crop production, particularly in seedbed preparation, after an initial plowing by tractors. However, animal traction programs are not new in the Eastern Region. In fact, there have been six different attempts to introduce the use of animal traction in the region prior to the inception of the EORD program. Barrett, 1980<sup>2</sup>, described the efforts between the 1940s until the late 1960s as partial or complete failures. Unfortunately, as will be shown by the various indicators in Section 4, the current EORD effort since 1974 has also been only a very limited success.

Moreover, the monopoly of cereal purchase and sale responsibility bestowed upon the ORD since 1974 has not succeeded in facilitating proper operation of agricultural product marketing in the Eastern Region. As shown in Table 4.12, the purchase and sale of crops was operated, during most of the period, at a financial loss to the ORD.

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<sup>1</sup>The EORD has been involved in the distribution of animal traction technology packages since its inception in 1968, but the large-scale effort started with the EORD/IRD funding in 1974.

<sup>2</sup>See Barrett, 1980, for the details of the history of animal traction schemes in Eastern Upper Volta. The report also discusses the problems associated with the earlier ANTRAC programs in the Eastern Region.

Consequently, the ORD's objective of accumulating revenue from sales activities so as to cover recurrent expenditure of other ORD program operations has not materialized.

Indeed, there are many factors associated with the poor performance of the current EORD agricultural production program. Above all else, much of the farming system in the region is characterized by high variability in production conditions, such as rainfall and soil quality. In most areas, rainfall is irregular and the soil is poor and sandy. The overall regional economy is also subsistence oriented. Less than 10 percent of most farmers' production passes through market channels, thereby limiting the availability of cash for the purchase of inputs as well as credit repayments. Moreover, experience has indicated that the EORD has not been able to provide, among other things, either an effective training and extension service or stable markets for the smallholder farmers in the region.

As indicated in Chapter IV, the agricultural extension system of the EORD is encumbered with a multitude of limitations. It is characterized as a one-way extension system lacking an effective research unit, hence poor research and extension linkages. Other major shortcomings of the extension system include: poor coordination among internal units of the ORD, as well as between the ORD and MDR; high cost of input delivery; inadequate training and insufficient logistical support for extension agents.

The lack of biologically stable and economically

profitable technical packages within the EORD agricultural program has been adequately discussed in the previous pages. Obviously, the absence of a viable message to extend, coupled with the lack of a systematic research effort, is one major factor curtailing the effectiveness of the extension program.

The field agents also have only minor academic training, and little if any practical training (see Table 5.1). Field personnel who are inadequately trained, inexperienced, and without support from a research unit that can generate a viable technical message to extend, are indeed incapable of effectively practicing their proper role as two-way communication agents between farmers and researchers/planners.

The EORD extension program is also characterized by a lack of coordination. As shown in the ORD's organizational chart, various departments, sections, sectors and subsectors are involved in the extension program. All department and sector heads are directly responsible to the ORD director. With the gradual increase in the number of ORD personnel, the structure has resulted in a very broad span of control, making it difficult for one man to handle effectively. Given the lack of day-to-day coordination of activities, the poor state of the roads, the lack of vehicles, and poor vehicle repair aggravate the problem further; leading, in the final analysis, to late or incomplete delivery of animal traction equipment and

spare parts. In evaluating the institutional performance of the EORD input delivery system, for instance, Tapsoba, 1981, finds a high cost of credit administration: about 28 CFA/100 CFA of total loan portfolio outstanding.<sup>1</sup>

The coordination at the national level is also weak. In theory, the MDR is expected to provide technical guidance to the ORD. The secretary-general of MDR is to coordinate the activities of the ORD with the technical departments of the ministry. To date, however, the EORD has not received adequate support from the technical services; the link between the two institutions remains quite weak both in the area of training and in the coordination of the national and regional applied research efforts.

The state of other supporting services, such as veterinary services, ANTRAC insurance, logistical support, and product marketing, leaves much to be desired. For instance, the veterinary services are so understaffed and underfunded that they are mostly unable to provide even minimal veterinary care on a regular basis for ANTRAC animals. Due to lack of proper veterinary care, morbidity rates and lost work time are very high for ANTRAC animals. Barrett, et al., 1981, reports that 22 percent of surveyed draft oxen teams lost an average of 10 days of work time during the May to mid-July plowing season of 1978 due to the

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<sup>1</sup>For a detailed assessment of the credit program, refer to Section 4.1 in Chapter IV. The administration cost is estimated by using 10 percent of the salary costs of EORD credit personnel from central staff to field staff level, and 10 percent of EORD operating costs including vehicle operation.

illness of at least one animal. During the same period, 6 percent of the surveyed donkeys lost an average of 5 days of work time due to illness. Mortality rates were 4.5 percent for oxen and 1.2 percent for donkeys during the 1978-79 agricultural season.

The lack of sufficient logistical support for extension agents is frequently discussed, particularly among the extension agents.<sup>1</sup> With regard to pay, for instance, extension agents believe that they are unfairly treated, pointing out that the wage scale which applied to them is far lower than those for people of similar qualifications and duties who are on related ORD pay scales, such as teachers (F.J.A.) and technical assistants (A.T.A.S). The position classification and the associated salary of an extension agent in comparison to others in the Voltaic civil service system is shown in Table 5.3. The other frequently heard complaint from extension agents regards the inadequacy of transport allowances. Although agents do receive a loan to purchase a motorcycle, their dissatisfaction is related to the continued rise in fuel prices without a corresponding adjustment to their allowances. These factors have bred low motivation and morale in the extension personnel, leading to an ineffective farmer education and/or draft animal training program. A similar weakness in the extension system of the EORD is manifested

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<sup>1</sup>Information acquired through an informal personal contact with ORD field level extension agents in late 1980 and early 1981.

**TABLE 5-3**

**PERSONNEL CHARGES FOR ORD PROFESSIONAL STAFF BASED ON  
CURRENT STAFFING AND 1980 PAY SCALES**

		CFAF per Person per Month				Per Year	Total Personnel Charges (CFAF Million/yr.)		
Level	#	Average a/ Salary	Allowances b/ Transport Housing	Social Security (18.5%)	Provision for d/ Promotion (3%)	Medical c/ Visits	Annual Bonus c/		
<u>Civil Servants</u>									
Ingenieur Agronome (IA)	A1	22	102000	-	18870	3060	2500	102000	35.0
Ingenieur Travaux Agricoles (ITA)	A2	4	90000	-	16650	2700	2500	90000	5.6
Conducteur Travaux Agricoles Specialise (CTAS)	B	56	63000	-	11655	1890	2500	63000	55.1
Agent Technique Agricoles Specialise (ATAS)	C	220	46000	-	8510	1380	2500	4600	158.2
Agent Technique Agricoles (ATA) <sup>e/</sup>	D	5	48000	-	8880	1440	2500	4800	3.8
<u>Subtotal</u>									257.7
Charged to MRD <sup>e/</sup>									(240.5)
Charged to ORD									( 17.2)

TABLE 5-3-Continued

	Level #	CEAF per Person per Month			Per Year	Total Personnel Charges (CEAF Million/yr.)
		Average a/ Salary	Allowances b/ Transport Housing	Social d/ Security (18.5%)	Provision for d/ Promotion (3%) Medical c/ Visits Bonus	
<u>Contractuals</u>						
Extension Workers	E	1355 35000 <sup>g/</sup>	3000 <sup>h/</sup>	2000 <sup>h/</sup>	6475 2500 35000	809.7
<u>Total</u>						1067.4
Charged to MRD						(240.5)
Charged to ORD						(826.9)

SOURCE: Staffing levels for 1979 (unchanged in 1980) obtained from Ministry of Rural Development, World Bank Report, 1982

NOTES: a/ From Ministry of Rural Development, Avant Projet de Budget, 1980. Represents weighted average salary paid in each category.

b/ Although individual civil servants are often paid allowances in the ORDs receiving donor finance, the National Budget, which reflects general practice in the Civil Service, does not allocate allowances for transport or housing. Since these actual allowances vary greatly by project and ORD, they are not included here. Allowances for responsibility are provided in the National Budget for select individuals in each Civil Service category. Allowances for family members (CEAF 700 per dependent) are also provided to Civil Servants, but an average payment per category has not been calculated here.

c/ These payments are included in some ORD budgets, but may not be paid if finance is lacking.

e/ Only the base salary, family allowances, social security payments and provision for promotion are presently financed directly by the Ministry budget for ORD staff who are Civil Servants; the remaining payments are to be financed by the ORD through its various revenues.

f/ Although these staff are of a lower grade than the ATAS, their higher average seniority accounts for a higher average salary.



TABLE 5-3-Continued

g/ Since a weighted average salary is not available for the entire service, this figure is obtained from the weighted average prevailing in the ORDs of Fada, Koudougou, Banfora and Bobo in 1980. It corresponds to the salary at the fourth (out of 13) echelon of the revised 1980 extension worker pay-scale.

h/ Allowances vary substantially among ORDs, but figures given are those cited most frequently in ORD budgets. Unlike Civil Servants, most extension workers are entitled to housing and transport allowances, but actual payment depends on availability of ORD Funds.

by the high level of personnel turnover. Fotzo, 1983, reports, for example, that nearly 50 percent of the extension agents dealing with bas-fonds had been in their posts for less than one year during the 1980-81 survey, reflecting poor knowledge of their area of responsibility and of their client farmers.

Indeed, the poor performance of the agricultural production and marketing program of the EORD is not limited to dryland farming activity. The ORD's attempt to increase output and income on bottom lands through water control mechanisms is also quite disappointing. Fotzo's investigation of four major bas-fond rice production systems differing in degrees of water control showed that, given current technologies and yield levels, production under improved water control results in negative income returns. His findings also showed that the least costly (and most economically profitable) technique for producing rice in the Eastern ORD is traditional cultivation in unimproved swamps. The major funding for dam irrigation in the EORD comes from the FAO/PNUD arrangement described in Chapter I.

After realizing the insignificant role of the ORDs, particularly in grain marketing, the government abolished the monopoly granted to ORDs in 1978. At the same time, some changes were introduced in the structure and operation practices of the national cereal agency (OFNACER). First, OFNACER was transferred from the Ministry of Commerce to the jurisdiction of the Ministry of Rural Development.

Secondly, OFNACER's grain acquisitions from farmers were now to be effected either through direct purchase by its purchasing agents or through licensed merchants and village groups as intermediaries. These new changes are perceived by many as positive steps towards improving the efficiency of moving agricultural products from producers to consumers. For instance, the association of OFNACER with MDR increases, at least in principle, its awareness of and relevance to the marketing problems at the farm level. Secondly, the increased involvement of the private sector in grain marketing would also enable OFNACER to concentrate its efforts more on supplying price information, developing transport and storage facilities, and thereby increasing grain trader competition locally as well as in neighboring states rather than directly intervening in the actual cereal marketing activity.

Following the changes at the national level, the EORD also gradually relieved itself of the grain marketing operation. However, based on donor financing, the EORD has continued its involvement with the creation and operation of cereal banks. As pointed out earlier, the management of cereal banks faces varied problems. The rate of loan repayment, although better than the animal traction credit rates, averaged only about 60 percent. Other problems of cereal bank management in the EORD include poor transport facilities, inadequate stocking capacity, unstable prices, lack of marketing information, poor extension

network, absence of processing units, etc. Nonetheless, with an increased farmer initiative, and participation in the financing, the grain banks may have a potential to serve as mechanisms for pooling local human and capital resources for stocking surpluses as well as for redistribution in the future at the local and regional levels. Aside from minimizing transportation costs and delays in future redistribution, such an arrangement can improve farmers' managerial ability, eventually enhancing a greater role for private sector marketing participants.

### 3. Potential Contributions of Animal Traction to the Farmer

The major mechanism of the EORD/IRDP for increasing agricultural output and income has been the expanded use of draft animals<sup>1</sup> in agricultural operations. The use of draft animals in farming operations is expected to contribute to higher output, as a result of the intensification<sup>2</sup> and the extensification<sup>3</sup> of land use. Theoretically, the use of draft animals is expected to raise the efficiency of resource use such as land and labor, thereby resulting in increased

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<sup>1</sup>Oxen and donkeys are the two most widely used draft animals in the EORD; such programs are popularly labeled in the literature as animal traction (ANTRAC) programs.

<sup>2</sup>Intensification refers to improvement in production per unit area.

<sup>3</sup>Extensification refers to increases in production due to expansion of the area under cultivation.

output. For instance, the most commonly cited scenario of effects leading to higher output includes the following:

- Antrac increases yield by enabling a farmer to work more rapidly--operations can be more timely enabling earlier planting to maximize the short rainy season, faster and more frequent weeding to reduce competition for scarce nutrients;

- Deeper plowing conserves water by increasing infiltration of rainfall;

- Plowing improves soil structure by loosening particles to facilitate root development;

- Plowing makes it easier to incorporate crop residues, which may raise soil fertility and reduces the runoff of rainfall;

- By saving time during critical periods of the season, a farmer can cultivate more land.

In addition to the above, use of draft animals on the farm is also expected to provide other benefits, such as manure that can be used to raise soil fertility, means of transport (donkey or ox cart for transporting

inputs/outputs), beef from slaughtering older oxen.<sup>1</sup> All three benefits can be transacted in the appropriate context<sup>2</sup> to generate cash, and thereby improve the level of household income.

The most widely cited disadvantage of an expanded use of animal traction is the likelihood of increased soil erosion.<sup>3</sup> Aside from stressing contour plowing and closed ridges, no-tillage farming<sup>4</sup> is often cited as the most effective way to control soil erosion.

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<sup>1</sup>The following benefits are also often cited when comparing animal traction to tractor mechanization:

- The acquisition price of oxen and equipment is within reach of many more small farmers.
- The purchase of animal-drawn equipment will require less expenditure of foreign exchange per unit of output than tractor mechanization (tractors, equipment, spare parts, fuel, etc.).
- Animal power will require less investment in supportive services and skilled manpower.
- Returns on investments in animal power are less sensitive to yield and price fluctuations.
- The costs of failure for an animal-powered mechanization scheme will be less because of higher relative salvage prices for the inputs.
- Animal-powered mechanization is less sensitive to poor management than tractor mechanization.

<sup>2</sup>Refers to likely gains resulting from selling beef from older traction oxen as well as income derivable from renting carts. According to some estimates, annual production of manure by a team of oxen can substitute for up to 24,000 CFA worth of commercial nitrogen.

<sup>3</sup>Research results suggest, however, that the erosion problem is not inherent in the ANTRAC technique. For instance, reports from IRAT indicate that the amount of soil lost under ox plowing is 4.09 Mt/ha, compared to 3.69 Mt/ha under manual cultivation.

<sup>4</sup>Usually requires the use of chemical herbicides.

In most instances, however, much of the literature concerning these potential advantages and disadvantages are based on either limited pilot farm projects or experimental station trials. Thus, the results from such sources cannot be expected to reflect the likely effects of on-farm animal traction programs. The historical evolution of the animal traction program in varied geographical locations and the various complex factors limiting its success are well documented by various authors.<sup>1</sup> However, the EORD/IRDP is one of a few projects that has attempted to assess the on-farm impact of the introduction of animal traction (see Lassiter, 1981; Barrett et al., 1982; and Wilcock et al., 1982).

#### 4. Empirical Results

##### 4.1. The Data Base

The analysis in this chapter relies very heavily on the 1978-79 farm level data and subsequent studies completed by the EORD/IRDP technical assistance team.<sup>2</sup> As indicated in earlier chapters, the 480 sample households consisted of 355 randomly selected hoe-farming households, and 125 purposely selected animal traction households (see Table 4.14 for distribution of the sample by zone, village

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<sup>1</sup>See deWilde et al., 1976; Kline et al., 1969; Weil, 1970; Migot-Adholla, 1972; Monnier, 1975; Oluwasanmi, 1975; Zerbo and Le Moigne, 1977; Le Moigne, 1980; Whitney, 1981; Sargent et al., 1981.

<sup>2</sup>See Chapter 4, Section 5, for discussion of the farm level data.

and sub-sample). As shown in the table, the data represents three types of technologies: hoe cultivation, oxen traction and donkey traction. The animal (oxen and donkey) traction data is categorized by the type of traction<sup>1</sup> as oxen zone or donkey zone. The hoe users are included as controls in both zones for the purpose of comparison. The performance of oxen and donkey traction is compared to that of hoe farming within the relevant zone: Diabo and Ougarou for the oxen zone; Piela, Diapangou, and Logobou for the donkey zone. A weighting procedure was used in calculating mean values in order to correct variation in sample size within the individual zones (see Barrett et al., 1982).

Nonetheless, the results of the comparative analysis need to be interpreted in the light of two limitations. First, comparisons between hoe and animal traction farmers are based on a single farm year survey. Secondly, the purposely sampled animal traction farmers represent the most successful animal traction farm households; they tend to be more educated and innovative types, and hence are not on the same footing with the randomly selected typical hoe farmers. The summary characteristics of farm households in the oxen and donkey zones are given in Table 5-4.

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<sup>1</sup>In the oxen zones, 90 percent of animal traction farmers use oxen traction. Among animal traction farmers in donkey zones, 85 percent use donkeys. For additional details, see Barrett et al., 1982.



TABLE 5.4

SUMMARY CHARACTERISTICS OF FARM HOUSEHOLDS IN THE  
OXEN AND DONKEY ZONES, 1978-79

	All ANTRAC Zones		Oxen Zones		Donkey Zones	
	HOE	ANTRAC	HOE	ANTRAC	HOE	ANTRAC
Number of Households Evaluated <sup>a</sup>	106	110	36	65	70	45
Persons per House- hold	7.75	11.21	6.67	11.14	8.83	11.27
Adult Workers per Household	3.50	4.71	3.04	5.27	3.96	4.14
Total Area Cultivated (ha) <sup>b</sup>	4.30	6.59	3.96	7.13	4.64	6.04
Proportion of Area in:						
Millet and Sorghum (%)	80.1	74.7	79.1	77.5	81.0	71.8
Groundnuts	9.6	9.6	10.3	6.8	8.8	12.4
Maize	3.0	3.4	3.3	3.8	2.7	2.9
Cotton	0.2	1.9	0.1	2.1	0.3	1.7
Rice	2.2	2.8	1.9	3.5	2.4	2.0
Soybeans	0.5	3.8	0.5	3.9	0.4	3.6
Other Crops	4.6	4.0	4.8	2.4	4.4	5.6
Total Area Cultivated per Person (ha)	0.560	0.588	0.593	0.640	0.526	0.536
Total Area Cultivated per Actif (ha)	1.26	1.39	1.29	1.33	1.22	1.45
Value of Livestock Owned (FCFA)	122,491	316,545	139,185	372,767	105,320	258,510
Percent of Non-Farm Income	18.7	12.5	32.0	7.5	0.6	21.5
Age of Household Head (years)	53	43	60	44	46	42
Education of Household Head (years)	.42	1.06	.44	.64	.40	1.65

<sup>a</sup> Because of time and resource constraints, complete area data was collected for only two-thirds of these households. In a random one-third sub-sample only sorghum and millet fields were measured. While harvest data was collected on all crops for all households, area data presented in this table are based only on measurements from two-thirds sub-sample.

<sup>b</sup> Estimated for the entire sample by using household size in the one-third subsample to project the non-sorghum/millet area.

SOURCE: Farm survey data and Barrett et al. 1982

## 4.2. Physical/Technical Effects

### 4.2.1. Acreage Effects

As shown in Table 5-4 cultivated areas are larger in animal traction households than in those of hoe farmers. Using the actif/area ratio as an indicator<sup>1</sup>, the area cultivated per actif is about 10 percent larger for animal traction farmers than to hoe farmers. The effects were 18 percent greater for surveyed donkey traction farmers, while they were 4 percent greater for oxen farmers. The increases in acreage per worker were larger for traction farmers who used animal traction for both plowing and weeding.<sup>2</sup> Table 5.5 presents more detailed data on household size, area cultivated by zone, and use of animal traction.

The overall difference in cropping mixture between animal traction and hoe farmers is insignificant. Both animal traction and hoe farmers devote 75 to 80 percent of their land to sorghum and millet. It is not uncommon, however, to find animal traction farmers growing more cash crops than the hoe farmers. With respect to household labor allocation, survey data indicated a reduction in field labor

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<sup>1</sup>Actif refers to a person of 15 to 55 years of age engaging in farming activities.

<sup>2</sup>It should be noted that even though labor may have been saved, expansion of cultivated area may not result if there is a shortage of land. In such instances, off-farm employment becomes a strong, viable option. On the other hand, labor savings may not be realized with poorly trained farmers and animals, or if the animal is in unsatisfactory condition early in the rainy season.

TABLE 5.5

HOUSEHOLD SIZE AND AREA CULTIVATED BY ZONE AND USE OF ANTRAC<sup>a</sup>

Zone	Type of Draft Animal	1 Number of Household Members During Rainy Season		2 Number of Active Workers (Persons 15-54 Years Old)	
		Hoe	ANTRAC	Hoe	ANTRAC
Diabo	Oxen	6.83	11.34	3.08	5.26
Ougarou	Oxen	7.92	12.10	3.92	6.20
Sub-total <sup>c</sup>	Oxen	7.09	11.52	3.28	5.41
Piela	Donkey	6.33	10.67	2.83	4.44
Logobou	Donkey	9.48	11.73	4.54	3.91
Diapangou	Donkey	7.75	12.00	3.33	4.70
Sub-total <sup>c</sup>	Donkey	8.26	11.53	3.81	4.24
TOTAL ALL FARMERS <sup>c</sup>		7.68	11.53	3.55	4.83

<sup>a</sup>These figures are calculated only for the households for which there was area data, which includes only two thirds of the sample in each zone. Thus, they differ slightly from those in Table 2.1 which provides estimates for the entire sample. Donkey or horse farmers in areas where oxen traction predominates were excluded. Thus, 1 farmer from Ougarou and 4 from Diabo are eliminated. Likewise, oxen farmers in areas where donkey traction predominates were excluded so that 3 from Piela, 1 from Logobou, and 2 from Diapangou are eliminated. Another farmer is missing from Ougarou because he had no area data.

<sup>b</sup>The zonal averages for Column 4 and 5 are the averages of each household's value. In earlier reports we presented a figure which represents the zone treated as one farm, i.e. we have divided the average farm size by the average number of household members and active workers to arrive at the figure.

<sup>c</sup>For the sub-totals, and totals, village averages were weighted differently because sub-sample sizes differed. See footnote 1, page 13.

Source: Farm Survey Data and Barrett et al 1981.

TABLE 5.5--Continued

3 Total Area Cultivated per Household (Hectare)		4 <sup>b</sup> Area Cultivated per House- hold Member (Hectare)		5 <sup>b</sup> Area Cultivated per Active Worker (Hectare)		6 Percentage Change in Area per Active Worker Due to ANTRAC
Hoe	ANTRAC	Hoe	ANTRAC	Hoe	ANTRAC	
3.98	7.44	0.63	0.70	1.40	1.49	+ 6.4
3.61	5.15	0.48	0.46	0.95	0.85	+10.5
3.89	6.89	0.59	0.64	1.29	1.34	+ 3.9
3.56	5.18	0.59	0.50	1.29	1.32	+ 2.3
4.68	4.91	0.47	0.54	1.11	1.51	+36.0
4.12	6.35	0.57	0.56	1.39	1.43	+ 2.9
4.26	5.34	0.53	0.54	1.22	1.44	18.0
4.08	6.10	0.56	0.59	1.20	1.39	10.3

use per hectare for animal traction farmers. Also, traction households spend a greater proportion of their time on livestock raising and agricultural trading (see Barrett et al., 1982).

### 3.2.2. Yield Effects

The crop yields per hectare for animal traction subsamples are generally higher for most cash crops (see Table 5.6). However, it is only corn in all zones and ground nuts in oxen zones that have statistically significant yield increases. There are several reasons, however, why the yield differences between hoe and animal traction farmers do not provide conclusive evidence of the impact of animal traction:

1. Inadequate control provision - despite the paired zonal comparison method used in the study, the large agro-climatic variability within the eastern region makes yield comparison very difficult. In some instances, fields within even one kilometer of each other can receive substantially different amounts and patterns of rainfall.
2. Use of average yields - the yield data reported in Table 5.6 were averaged from both plowed and unplowed fields, thereby understating the potential yield impact of animal traction.
3. Use of incomplete package - few animal traction farmers use the complete animal traction package in the survey area. Subsequently, the yields for animal traction farms were averaged across all cultivated fields, whether

TABLE 5.6

YIELDS<sup>a</sup> FOR MAJOR CROPS UNDER HOE, OXEN AND  
DONKEY CULTIVATION IN ANTRAC STUDY  
ZONES, 1978-79 (kgs/hectare)

Crops	All ANTRAC Zones		Oxen Zones		Donkey Zones	
	HOE	ANTRAC	HOE	ANTRAC	HOE	ANTRAC
Millet and Sorghum	466	468	555	554	377	381
Groundnuts	213	238	59	179	366	296
Maize	425	686	500	746	349	585
Cotton	108 <sup>b</sup>	171	118 <sup>b</sup>	253	97 <sup>b</sup>	88
Rice	442	465	329	630	554	300
Soybeans	283 <sup>b</sup>	197	241 <sup>b</sup>	294	324 <sup>b</sup>	99

<sup>a</sup>Yields presented here are weighted averages per hectare based on estimates of total household production in 1978-79. They are calculated only for the two-thirds random subsample of farmers for which complete cultivated acreage was measured.

<sup>b</sup>These estimates are based on a small number of observations representing less than one hectare of cropland per zone.

Source: Farm Survey Data and Barrett et al 1982.

or not they were plowed or weeded with animal power. A regression analysis of sorghum/millet yields showed that the use of animal traction was not significantly related to yields. However, yields were positively related to number of workers and labor inputs per hectare, and negatively related to farm size.

4. Drought effect - in the 1978-79 growing season, two communities in the donkey zone, Piela and Diapangou, have suffered a severe drought which cannot be disregarded in comparing the performance of donkey and oxen traction versus hoe across zones.

#### 4.3. Economic/Financial Effects

As pointed out in earlier chapters, farm level incomes are derived from various sources: crop production, livestock raising, crop and livestock trading, crop processing, as well as other sources of income such as pensions, inheritance, and cash gifts. The focus of the analysis in this subsection is to determine whether ANTRAC increased farm income.

##### 4.3.1. Costs of Production

The various farm revenues reported in Table 5.7 are associated with variable and fixed costs of production. The cost effects are quite significant, particularly for the traction farmers in the crop production enterprise.

As shown in Table 5.7, the variable costs per household, in 1978-79 for crop-producing oxen farmers

TABLE 5.7

## FARM HOUSEHOLD ANNUAL INCOME STATEMENT, 1978-79

	Oxen Zones		Donkey Zones	
	TRAD	ANTRAC	TRAD	ANTRAC
Number of Households	36	64	72	46
I. Crop Production Enterprise				
<u>Revenue</u>				
Value of Crop Production <sup>a</sup>	85,591	149,356	83,601	94,012
of Which, Value Sold	6,661	9,680	9,569	13,798
Contract Plowing Revenues	0 +	524	0 +	70
Contract Transport <sup>d</sup> Revenues	0 +	136	0 +	1,635
<u>Variable Costs</u>				
Purchased Seed	- 484 -	583	- 784 -	1,273
Value of Household Seed <sup>a</sup>	- 4,175 -	7,930	- 4,444 -	6,981
Fertilizer and Insecticides	- 28 -	402	- 153 -	788
Wage Labor	- 250 -	490	- 217 -	315
Grain Purchased for "Invitation" <sup>b</sup> Field Labor	0 -	31	0 -	48
ANTRAC Feed Grain (Purchased)	0 -	640	0 -	328
ANTRAC Feed Grain (Value of Household Grain) <sup>d</sup>	0 -	1,672	0 -	2,826
Other ANTRAC Maintenance Costs <sup>c</sup>	0 -	3,232	0 -	980
<u>Fixed Costs</u>				
Repairs to ANTRAC Equipment	0 -	68	0 -	26
Replacement Parts for ANTRAC Equipment	0 -	1,012	0 -	1,075
Interest Payments for ANTRAC Credit	0 -	1,915	0 -	47
Depreciation on ANTRAC Equipment	0 -	5,229	0 -	5,095
Depreciation on ANTRAC Animals <sup>e</sup>	0 +	22,645	0 -	2,081
Repairs of Other Tools and Equipment	- 36 -	67	- 61 -	77
Depreciation on Other Tools and Equipment	- 1,996 -	3,170	- 2,324 -	2,678
<u>Net Revenue</u>				
Net Revenue from Crop Production	78,622	146,220	75,572	71,099



TABLE 5.7-Continued

	Oxen Zones		Donkey Zones	
	TRAD	ANTRAC	TRAD	ANTRAC
II. Livestock Enterprise				
<u>Revenue</u>				
Sales of Animals	3,652	27,693	17,337	33,281
Sales of Animal Products	345	5,434	1,684	680
<u>Costs</u>				
Animal Purchases	- 5,556	- 26,961	-10,127	-30,924
Feed and Maintenance Expenses	- 441	- 1,031	- 3,076	- 1,641
<u>Net Revenue</u>				
Sub-total	- 1,970	5,135	5,818	1,396
III. Agricultural Trading				
<u>Revenue</u>				
Value of Sales (Net of Transport Costs)	1,594	2,877	7,867	17,913
<u>Costs</u>				
Value of Purchases (Net of Transport Costs)	- 1,358	- 3,406	- 6,682	-19,402
Depreciation	- 61	- 599	- 234	- 215
Change in Value of Inventories <sup>a</sup>	0 +	2,058	- 9 +	3,626
<u>Net Revenue</u>				
Sub-total	175	930	942	1,922
IV. Agricultural Transformation & Gathered Crops				
<u>Revenue</u>				
Sales of Transformed Crops	1,052	2,744	1,994	8,185
Sales of Gathered Crops	513	3,406	994	631
<u>Costs</u>				
Purchases of Variable Inputs	- 797	- 2,718	- 1,489	- 9,897
Depreciation on Equipment	- 240	- 254	797	- 339
<u>Net Revenue</u>				
Sub-total	528	3,178	702	- 1,420
NET FARM INCOME	77,355	155,463	83,026	72,997

TABLE 5.7-Continued

	Oxen Zones		Donkey Zones	
	TRAD	ANTRAC	TRAD	ANTRAC
V. Other Sources of Income				
<u>Revenue</u>				
Gross Returns to Non-Ag.				
Trading & Artisanal				
Activities	38,422	14,822	8,858	34,385
Salaries	11	484	0	4,817
Pensions	0	5,807	9	860
Inheritance & Net Cash				
Gifts	- 382	14	- 2,673	5,972
<u>Costs</u>				
Variable Costs of Non-				
Ag. Trading & Artisanal				
Activities	- 1,120	- 7,943	- 5,156	-24,457
Depreciation	- 572	- 641	- 527	- 1,535
<u>Net Revenue</u>				
Sub-total	36,359	12,543	511	20,042
TOTAL NET HOUSEHOLD INCOME	113,714	168,006	83,537	93,039

SOURCE: Farm Survey Data and Barret, et al. 1981.

amounted to 14,980 FCFA; costs were 13,539 FCFA for donkey traction farmers. In contrast, the variable cost for average oxen/donkey zone hoe farmers amounted to 4,268 FCFA during the same period.

The operating ratio (variable expenses/income ratio) for the crop production enterprise is .10 for oxen traction, .14 for donkey traction, and .06 for the hoe farmers. In contrast, the fixed ratio is .08 for oxen traction, .12 for donkey traction, and .03 for hoe farmers. These figures indicate that 18 cents per dollar of the gross crop enterprise income is spent on variable and fixed costs by oxen traction farmers. Similarly, 26 and 9 cents per dollar of gross crop enterprise income are spent on variable and fixed income costs by donkey traction and hoe farmers respectively. This leaves a margin of 82 cents on each dollar of sales for oxen farmers, 74 cents for donkey traction farmers, and 91 cents for hoe farmers. Table 5.7 shows the costs associated with the various sources of income. The depreciation schedule and the explanatory notes accompanying Table 5.7 are presented in Table 5.8. As the income from crop production has not been adequate, animal traction farmers rely on revenues from carting as well as other non-farm sources to cover the various categories of expenditure.

TABLE 5-8  
DEPRECIATION SCHEDULE

ANTRAC Item	1978 Price (FCFA)	Estimated Working Life (Years)	Salvage Value (FCFA)	Annual Depreciation (FCFA)
<b>Oxen Traction:</b>				
Plow	18,250	10	2,000	1,652
Weeder	19,635	7	1,500	2,591
Ridger	6,470	5	500	1,194
Accessories	7,225	5	250	1,395
Cart	44,735	10	3,000	4,174
1 Ox	35,000	4	75,000	+10,000
<b>Donkey Traction:</b>				
Plow	11,320	10	1,000	1,032
Weeder	17,200	8	1,500	1,963
Ridger	4,850	6	500	725
Accessories	5,185	5	200	997
Cart	44,735	10	2,000	4,274
1 Donkey	18,000	7	3,000	2,143

Source: Farm Survey Data and Barrett, et al. 1981.

<sup>a</sup>Valued at the average "realized" sales price for each crop.

<sup>b</sup>Refers to cart rental services. This does not include the sale of carted products, such as firewood, but only the rental of the cart for transport use.

<sup>c</sup>"Invitation" labor refers to festive work parties of a reciprocal nature in which food and sorghum beer are the primary in-kind payment. These cash purchases of grain

TABLE 5-8-Continued

substantially understate the real costs of invitation labor which primarily utilizes household food stocks, rather than purchased grain.

<sup>d</sup>Chiefly non-grain feeding expenses, salt, and medicines for draft animal maintenance.

<sup>e</sup>Actual changes in the value of livestock inventories over the year are unknown, due to lack of analysis of the necessary data files. No change in livestock inventories is assumed.

<sup>f</sup>Values in parentheses represents net appreciation, and thus a revenue rather than an expense.

#### 4.3.2. Revenue

##### 4.3.2.1. Crop Production Enterprise

Table 5.9 presents the total value of crop production<sup>1</sup> by hoe and ANTRAC farmers for the 1978-79 production season. As shown in the table, the average value per farmer of crop production is 84,596 FCFA, 149,356 FCFA, and 94,013 FCFA in the hoe, oxen, and donkey farmers' households respectively. In all three cases, sorghum, millet and niadi are the most important crops, representing over 70 percent of the total crop value for the 1978-79 period.

Out of the total value of the crops, the proportion of value sold is very insignificant (see Table 5.7). On the average, the value of crops sold from the hoe household members of the oxen and donkey zones is 8115 FCFA. The value of crops sold from the oxen traction households is 9680 FCFA, while it is 13,798 FCFA for the households in the donkey traction zones.

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<sup>1</sup>A detailed crop enterprise budget has been prepared by Lassiter for sorghum/millet, maize, ground nuts, soybeans, cotton and rice in Cropping Enterprises in Eastern Upper Volta, 1981. Fotzo, The Economics of Bas-Fond Rice Production in the Eastern Region of Upper Volta: A Whole Farm Approach, 1983, also provides enterprise budgets for crops in the lowland farming system.

TABLE 5-9

## VALUE OF CROP PRODUCTION

Crop	Price/Kg. <sup>a</sup>	Oxen Zones				Donkey Zones			
		Hoe		ANTRAC		Hoe		ANTRAC	
		FCFA	%	FCFA	%	FCFA	%	FCFA	%
Sorghum	45.5	59,821	69.9	81,167	54.3	36,449	43.6	36,871	39.2
Milllet	45.5	12,792	14.9	29,206	19.6	18,775	27.5	13,217	14.1
Niadi <sup>b</sup>	45.5	0	0.0	14	0.0	7,319	8.8	10,476	11.1
Maize	39.6	2,663	3.1	6,767	4.5	2,827	3.4	4,129	4.4
Groundnuts	68.9	1,971	2.3	4,857	3.3	1,114	1.4	11,447	12.2
Bambara Nuts	59.0	1,103	1.3	1,242	0.8	1,109	1.3	1,105	1.2
Cowpeas	73.2	5,192	6.1	10,035	6.7	8,105	9.7	6,551	7.0
Soybeans	72.4	239	0.3	4,302	2.9	282	0.3	1,013	1.1
Sesame	57.6	6	0.0	39	0.0	421	0.5	561	0.6
Cotton	67.4	58	0.1	1,818	1.2	73	0.1	916	1.0
Rice	90.2	1,746	2.0	9,909	6.6	7,127	8.5	7,726	8.2

TABLE 5-9--continued

Crop	Price/Kg. <sup>a</sup>	Oxen Zones			Donkey Zones		
		Hoe		ANTRAC	Hoe		ANTRAC
		FCFA	%	FCFA	%	FCFA	%
Total for All Crops		85,591		149,356		83,601	94,012
Sorghum, Millet, and Niadi		72,613	84.8	110,387	73.9	62,543	74.8
						60,564	64.4

SOURCE: Farm Survey Data and Lassiter, 1982.

<sup>a</sup>This represents the weighted average selling price realized by sample households during the 1978-79 survey period.

<sup>b</sup>A 60-day, short season millet variety grown in the Logobou area.



#### 4.3.2.2. Other Sources of Family Income

Even though crop production is the largest source of family income, livestock raising<sup>1</sup>, agricultural trading<sup>2</sup>, and agricultural processing are also major components of farm income in the Eastern Region. For instance, the reported revenue of the livestock enterprise arises from the sale of animals and animal by-products. In the case of oxen traction, however, the growth in value of farm livestock inventories over the 1978-79 season is not included in the income statement calculation. Income generated from agricultural trading, agricultural transformation, and other sources are accounted for in Table 5.7. Other contributions to household income arise from non-agricultural and artisanal activities, salaries, pensions, inheritance, and gifts. The relative importance of the different sources of household income and selected efficiency measures are presented in Table 5.10. In addition, the traction farmers have also reported income from contract

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<sup>1</sup>Estimated appreciation value of an ox (10,000 CFA) has not been included in the statement. It should be noted, also, that donkey cart revenue in Table 5.7 may substantially underestimate potential revenue from carting in certain areas. In heavily populated areas such as Diapangou, Piela and Logobou, there is a flourishing market for firewood sold largely from the household in small bundles. In general, this is a substantial potential source of revenue; in some areas, donkey wood haulers can easily net 10,000 FCFA per month (Wilcock, 1981).

<sup>2</sup>See Ouedraogo on crop and livestock trading, forthcoming dissertation, 1983; and Wilcock on small-scale rural enterprises in the Eastern ORD. Also see Negash, Research Proposal for Rice and Sorghum/Millet Processing in Eastern Upper Volta, 1981; also see Fenton for analysis of livestock enterprises in the Eastern Region, forthcoming dissertation, 1983.

TABLE 5.10

## SUMMARY OF HOUSEHOLD INCOME CHARACTERISTICS

	<u>Oxen Zones</u>		<u>Donkey Zones</u>	
	Hoe	ANTRAC	Hoe	ANTRAC
<u>Value of Major Income Components</u>	(FCFA)	(FCFA)	(FCFA)	(FCFA)
I. Crop Production	78,622	146,220	75,572	71,099
II. Livestock Raising	-1,970	5,135	5,818	1,396
III. Crop Trading	175	930	942	1,922
IV. Agricultural Transformation	528	3,178	702	-1,420
V. Other Sources of Income	36,359	12,543	511	20,042
NET FARM INCOME <sup>a</sup>	77,355	155,463	83,026	72,997
NET HOUSEHOLD INCOME	113,714	168,006	83,537	93,039
<u>Relative Importance of Income Components</u>	(Percent)	(Percent)	(Percent)	(Percent)
I. Crop Production (% of Total)	69.1	87.0	90.5	76.4
II. Livestock Raising	-1.7	3.1	7.0	1.5
III. Crop Trading	0.2	0.6	1.1	2.1
IV. Agricultural Transformation	0.5	1.9	0.8	-1.5
V. Other Sources of Income	32.0	7.5	0.6	21.5
<u>Efficiency Measures</u>	(FCFA)	(FCFA)	(FCFA)	(FCFA)
Net Cropping Income per Person	11,787	13,126	8,559	6,309
Net Cropping Income per Adult Worker	25,863	27,745	19,084	17,174
Net Cropping Income per Hectare	19,854	20,508	16,287	11,771

TABLE 5.10---continued

	<u>Oxen Zones</u>		<u>Donkey Zones</u>	
	Hoe	ANTRAC	Hoe	ANTRAC
<u>Efficiency Measures (continued)</u>				
Net Farm Income per Person	11,597	13,955	9,403	6,477
Net Farm Income per Adult Worker	25,446	29,450	20,968	17,632
Net Farm Income per Hectare	19,534	21,804	17,894	12,085
Net Household Income per Person	17,049	15,081	9,461	8,256
Net Household Income per Adult Worker	31,879	31,879	21,095	22,473
Net Household Income per Hectare	28,716	23,563	18,003	15,404

SOURCE: Farm Survey Data and Barrett, et al., 1981.

<sup>a</sup>Net Farm Income is the sum of major income components I through IV.

plowing and transport revenues.

Based on the 1978-79 study, the income effects of animal traction at the farm level were found to be negligible. Oxen farmers attained a 16 percent increase in net farm income per active worker from crop production. However, the major portion of the increase is attributable to appreciation in the value of oxen through weight gains. Donkey traction farmers' incomes were found to be lower than those of hoe farmers in the same zones, mainly due to adverse (drought) conditions that affected about 70 percent of the donkey zones during the 1978-79 period.

#### 4.3.3. Cash Flow Analysis

Table 5.11 shows the household annual cash flows (difference between cash receipts and cash expenses) for the oxen and donkey zone farmers. The annual net cash flow for hoe farmers (averaged for both the oxen and donkey zones) is a positive 21,479 FCFA. The net flow for the donkey traction farmers is also a positive amount, of 8,525 FCFA. However, the net cash flow figures are negative for the oxen farmers to the amount of 643 FCFA. The net cropping cash surplus is negative for all three categories.

The absolute values of the annual cash flow for all categories, and the value of cash inputs into crop production, are extremely low. However, the absolute value

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<sup>1</sup>It should be noted, however, that the actual sales value of marketed production is about 10 percent of the total reported crop value; hence the reported margin is actually unattainable.

TABLE 5-11

## ANNUAL CASH FLOW STATEMENT

Cash Flow Item	Oxen Zones		Donkey Zones	
	Hoe	ANTRAC	Hoe	ANTRAC
<u>Crop Production</u>	(FCFA)	(FCFA)	(FCFA)	(FCFA)
Value of Sales	6,661	9,680	9,569	13,798
Non-ANTRAC Inputs	-1,752	-2,682	-2,879	-2,621
ANTRAC Related Current				
Cash Expenses	0	-4,502	9	-2,409
ANTRAC Related Revenues	0	660	0	1,705
<u>Net Cropping Cash</u>				
Revenue	4,909	3,156	6,681	10,473
Major Food Purchases	-4,966	-11,617	-9,505	-20,782
<u>Net Cropping Cash</u>				
Surplus	-57	-8,461	-2,824	-10,309
<u>Livestock Production</u>				
Revenues	3,997	33,127	19,021	33,961
Expenditures	-5,967	-27,992	-13,203	-32,565
<u>Agricultural Trading</u>				
Revenues	1,594	2,877	7,867	17,913
Expenditures	-1,358	-3,406	-6,682	-19,402
<u>Agricultural Processing and Gathering</u>				
Revenues	1,565	6,150	2,988	8,816
Expenditures	-1,037	-2,972	-2,286	-10,236
<u>Other Sources of Income</u>				
Revenues	38,051	21,127	6,194	46,034
Expenditures	-1,120	-7,943	-5,156	-24,457
<u>Capital Expenditures</u>				
Non-ANTRAC Equipment				
Purchased	-183	-126	-504	-276
ANTRAC Equipment				
Purchases	-333	-640	-0	-2,399
<u>Credit</u>				
Inflows	1,155	6,853	2,854	9,169
Outflows	-1,870	-19,237	-3,138	-7,724
NET ANNUAL CASH FLOW	34,437	-643	5,131	8,525

<sup>a</sup> Net Farm Income is the sum of major income components I through IV.

SOURCE: Farm survey data and Barrett et al. (1981)

of cash inputs into crop production is quite large if viewed relative to the amount of cash revenue generated from crop production. In the two zonal aggregates of hoe cultivation, the cash inputs are 28 percent of the value of sales. For the oxen traction farms, net current cash costs comprised 67 percent of crop sales, leaving a net cash revenue of only 3,156 FCFA. The expenses for donkey traction are less than those for oxen--24 percent of crop sales.

The median animal traction farmer had three years of experience. Hence, with the typical package (a pair of oxen and a plow, or one donkey and a plow) this implies that the typical oxen farmer surveyed should have paid 22,600 CFA a year, while a donkey farmer's repayment burden amounts to 14,175 FCFA for a year. If these repayment values are taken into account (net of ANTRAC credit repayments already included in Table 5.11), the net cash flow on an annual basis becomes -10,546 FCFA for oxen farmers and -5,366 FCFA for donkey farmers.

The net monthly cash flow position for hoe farmers is also low throughout the year except during the post-harvest period (November to early May). The May through August period corresponds to what is generally known as the "hungry season", and one would expect some farmers to purchase food during this period. The net monthly cash flow fluctuates more for ANTRAC farmers than for hoe farmers, mainly due to ANTRAC-related cash costs.

The cash deficit becomes relatively substantial when the food purchases of the May-July period are subtracted from the net cropping revenue. Thus, the increase in the magnitude and timing of production costs poses a serious cash flow problem, particularly for oxen farmers. To be successful, oxen traction adopters are obliged to search out and utilize alternative sources of liquidity, such as sale of livestock, non-farm cash sources, and credit from formal and informal sources (see Table 5.10 for details on possible sources of revenue in the EORD).

#### 4.4. An Assessment of the Animal Traction Package's Viability

The purpose of this subsection is to examine the viability of the ANTRAC package as currently delivered to the EORD farmers. The relevant issues will be discussed in three areas: rate of adoption, scope for increasing future profitability of the package, and the need for adoptive farmer assessment research orientation.

##### 4.4.1. Rate of Adoption

During the 1974-1981 period, the rate of adoption of the animal traction package has been fairly satisfactory. In 1974, the number of farmers using animal traction was 180. This increased to 1,360 in 1979 and to 1,540 to 1981. These figures imply an eight-fold increase in adoption between 1974 and 1981. However, there are reasons that call for a cautious interpretation of this impressive rate of adoption. First, it should be noted that only about 3

percent of the EORD households have had access to the program. Secondly, as indicated in Chapter IV, the rate of animal traction loan repayment, which averaged 32 percent for the last few years, is quite weak by most standards. Above all else, the animal traction package demonstrated only a limited technical and financial viability at the farm level. With respect to the technical impact, for instance, only a 10 percent increase in cultivated acreage per active worker was associated with animal traction use, and no appreciable increase in yield per hectare was observed among the adopters. Subsequently, this limited increase in output is reflected by insufficient net revenue from crop production, aggravating the cash flow problem at the farm level.

#### 4.4.2. Scope for Increasing Profitability

Although the current performance is disappointing, the scope for increasing future profitability of traction enterprises in the Eastern Region appears encouraging. Results of both on-farm trials<sup>1</sup> and a 10-year capital budgeting analysis<sup>2</sup> provide some cause for optimism.

A field trial was conducted in 1979 to test the effects of animal traction on output. As shown in Table 5.12, the increase for sorghum and millet is 16.7 percent over

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<sup>1</sup>Based on harvest data obtained from 24 sorghum fields and 19 peanut fields; see Barrett et al., 1982.

<sup>2</sup>See Lassiter, 1982.



TABLE 5-12

RESULTS OF NATURAL PHOSPHATE FERTILIZER AND PLOWING TRIALS  
CONDUCTED IN THE EASTERN REGION IN 1979

Treatment	Sorghum/Millet		Groundnuts	
	Treatment Results	Confidence Interval at 95% Certainty Level	Treatment Results	Confidence Interval at 95% Certainty Level
T1: yield of control plot (land prep. by hand no fertilizer) Kg/Ha	531.0	+117.5	582.1	+128.8
T2: land prep by hand; 150 Kg. phosphate. Percent increase over control plot yield	30.2%	+ 20.5%	11.4%	+ 11.4%
T3: ANTRAC plowing and 150 Kg. phosphate. Percent increase over control plot	65.0%	+ 25.2%	26.8%	+ 21.1%
T4: ANTRAC plowing, no fertilizer. Percent increase over control plot	16.7%	+ 14.6%	18.2%	+ 12.4%

Source: EORD BPA Plowing/Phosphate Trials, 1979.

the control plot when practising only animal traction plowing, while the simultaneous practice of animal traction plowing and phosphate fertilizer application<sup>1</sup> provides an impressive yield increase of 65 percent over the control plot for sorghum and millet. Similarly, a 10-year capital budgeting analysis has indicated a positive potential for animal traction cultivation, assuming different levels of technology adoption. The 10-year planning horizon of the capital budgeting analysis has assisted in incorporating the learning factor in the derivation of expected net revenue at varying stages of technology adoption. In both instances, however, it is apparent that practicing traction plowing alone, which represents the technique most commonly used by EORD animal traction farmers in the 1978-79 period, is not a viable technical package. However, the incremental income more than triples for an analysis which assumes a complete package adoption (plowing, weeding, and application of phosphate fertilizer). This performance in sorghum and millet production has great significance for the Eastern Region, where over 80 percent

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<sup>1</sup>The natural rock phosphate used comes from Kodjari in the Diapaga sector of the EORD. It is composed of 64 percent tricalcium phosphate and has 30 percent content in phosphorus pentoxide ( $P_2O_5$ ) and a 40 percent content of quicklime or calcium oxide ( $CaO$ ). It is crushed to a fineness such that 90 percent of the particles are smaller than 0.09 millimeters in diameter. The solubility of the phosphate varies between 25 and 33 percent per year depending on rainfall and other factors. The official EORD price is 20 FCFA/kg.

of the cultivated cropland is devoted to its production. Therefore, one of the available options<sup>1</sup> for narrowing the gap between the realized and the potential rates of return calls for a persistent effort to facilitate a complete, but gradual, adoption of the package by the farmers.

#### 4.4.3. Need for Farmer Research Orientation

The various elements of the technical package articulated at the initial stage of the EORD/IRDP to achieve sustained increase in small farmer agricultural production included such themes as use of animal traction, improved cultural practices, use of improved seed varieties and use of mineral fertilizer. However, these technical themes originated from experiment station research conducted outside the EORD, mainly in the western part of Upper Volta. Although western Upper Volta possesses ecological conditions distinct from those in the Eastern region, the various technical themes were distributed to farmers located throughout the Eastern Region. Moreover, as pointed out in Chapter III, the agricultural conditions within the Eastern Region are heterogenous with respect to labor availability, pest problems, water availability, soil type and structure, etc.

The missing link is an on-farm research program

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<sup>1</sup>Additional step required to improve overall farm viability and farmer loan repayment capacity entails promoting selected cash crops/enterprises in the farming system.

with farmer assessment research orientation. Using this mechanism, data can be generated from farmers regarding their reactions as well as other information that can be used for checking the adoptability and the consistency of the various technical themes with the conditions in the region. Within such a framework, the process of enhancing the viability of the technical themes (the traction package) requires, first of all, recognizing the diversity of the region's agroclimatic zones; and, second, identifying the priority research areas (seed variety, soil fertility, development for drought resistance, storage improvements, etc.) for the priority crops. Experience suggests that long years of an applied research program of on-farm orientation, backed up with an experimental station research effort, are essential to develop the relevant space-specific technical information on better seed varieties, appropriately tested tillage techniques, correct rates of fertilizer application, proper calendar of farm operation, etc. As discussed earlier, this type of technical information is indispensable to maintain an effective farmer-extension agent-research/planner linkage.

### 5. Synthesis

The potential capacity of animal traction programs for increasing agricultural output and income of smallholder farmers has long been realized by researchers and policy makers in many West African countries. The effort exerted to expand animal traction programs in the Eastern ORD is one

clear manifestation of such realization. Unfortunately, as indicated by the various technical and economic indicators, the project performance during the 1974-1981 period reflects a significant gap between the expected and the realized outcomes. Nonetheless, results of on-farm trials and budget analysis with different assumptions on levels of technology adoption suggest an encouraging prospect and a wide scope for inducing adjustments in policy and operating practices to facilitate increased long-run farm-level returns for the smallholder farmers in the region.

Two outstanding problems curtail the current performance of the EORD agricultural production and marketing program. First, the technical themes delivered to the farmers, as practiced currently, are incapable of generating satisfactory returns, mainly because the current themes are based on experiment station research output that did not incorporate, during its design phase, farmer objectives, farmer resource endowments, and other farm level constraints that are prevalent in the Eastern Region. Moreover, due to lack of an on-farm research program, there is no continuing effort to generate space-specific technical information on better seed varieties, tested tillage techniques, correct rates of fertilizer application, proper calendars of farm operation, etc. Consequently, it has not been possible to maintain an effective farmer-extension agent-researcher linkage within the EORD extension system.

Secondly, the EORD, which was assumed to be an effective mechanism for planning and implementing the necessary support services required to facilitate increased output of smallholder farmers, has not been able to discharge its responsibilities successfully. Several shortcomings of the policies and operating practices of the EORD have been noted, especially with respect to personnel and financial management, input delivery, and product marketing activities. The extent to which these limitations eventually contributed to the poor performance of the EORD/IRDP has also been briefly traced.

Now that the IRDP is completed, the EORD is prepared to launch the next phase of its food production program. This, then, leads to one most timely and relevant question--what has the EORD learned from its experience in the 1974-81 period that it can gainfully utilize for improving its future performance? Indeed, the first phase in internalizing such experience requires isolating and prioritizing the relevant issues that are likely to influence future performance. In the final analysis, however, the usefulness of the learning experience depends to a greater extent on provisions laid out during the design phase to minimize recurrence of similar problems during future implementation. The main focus of the next chapter is to pursue and explore such questions in the light of the 1982-1987, Phase II, EORD program proposal.

## 6. Summary

This chapter provides the highlights of the EORD/IRDP animal traction package's farm-level production impact from 1974 to 1981. The first portion of the chapter assesses the role of the EORD in promoting agricultural development within the Eastern ORD setting. The second portion of the chapter discusses the potential contribution of animal traction programs to higher farm output and income resulting from intensification and extensification of land use. The presentation in the third portion focuses on empirical results from the EORD/IRDP oxen and donkey traction experience.

The assessment of the technical and economic effects is based on the 1978-79 farm level data and subsequent studies completed by the EORD/IRDP technical assistance team. With respect to the area expansion effect, for example, the data indicates that, using the actif/area ratio as an indicator, the area cultivated per actif is over 10 percent larger for animal traction farmers compared to hoe farmers. The increase in acreage per worker was larger for traction farmers who used ANTRAC for both plowing and weeding. With respect to household labor allocation, the survey data indicates a reduction in field labor use per hectare for animal traction farmers. Even though traction farmers tend toward growing more cash crops and allocate a greater proportion of their time to livestock raising and agricultural trading, both ANTRAC and hoe farmers devote 75 to 80 percent of their land to sorghum and millet.

With the exception of corn and groundnuts, the yield increase per hectare has not been significant. However, because of a multitude of factors--such as inadequate control, limitations of use of average yields, incomplete techniques, and the effects of drought--the yield difference between hoe and animal traction farmers is insufficient to provide conclusive evidence of this impact of the animal traction program.

Farm-level incomes in the EORD are derived from various sources: crop production, livestock raising, crop and livestock trading, crop processing, as well as other sources such as pensions, inheritance, and cash gifts. Based on the 1978-79 study, the income effects of animal traction at the farm level were found to be negligible. Oxen farmers attained a 16 percent increase in net farm income per active worker from crop production. Donkey traction farmers' incomes were found to be lower than those of hoe farmers in the same zones.

The cost effects are found to be significant, particularly for the traction farmers. For instance, 18 cents per dollar of the gross crop enterprise income is spent on variable and fixed costs by oxen traction farmers. Similarly, 26 and 9 cents per dollar of gross crop enterprise income are spent by donkey traction and hoe farmers respectively. The income from crop production has not been adequate to cover the various categories of expenditure. In the two zonal aggregates of hoe cultivation, the cash



inputs were found to be 28 percent of the value of sales. The cash costs comprised 67 and 24 percent of crop sales for the oxen and donkey traction farms, respectively. Thus, the magnitude and timing of production costs poses a serious cash flow problem, particularly for oxen traction farmers. To be successful, the traction adopters are obliged to discover and use alternative sources of liquidity, such as the sale of livestock, and non-farm cash sources including formal and informal credit.

As indicated by the various technical and economic indicators, the project performance during the 1974-81 period reflects a significant gap between the expected and the realized outcomes. However, results of on-farm trials and budget analysis suggest an encouraging prospect and a scope for inducing adjustments in policy and operating practices to facilitate increased long-run farm-level returns for the smallholder farmers in the region. It is also noted that the technical themes delivered to the farmers, as practiced currently, are incapable of generating satisfactory returns. Moreover, due to lack of an ongoing on-farm research program, there is no space-specific technical information to maintain an effective farmer-extension agent-researcher linkage within the EORD system. Similarly, several shortcomings of the policies and operating practices of the EORD have been noted, illustrating its inability to provide the necessary support services required to facilitate increased output and income of smallholder farmers.

The need to learn from past experience has been stressed as a means to minimize recurrence of similar problems in future programs in the Eastern Region.

## CHAPTER VI

### LESSONS FOR THE DESIGN AND IMPLEMENTATION OF

#### PHASE II ACTIVITIES: 1982-1983

##### 1. Introduction

In 1978, while the EORD/IRDP was still in progress, the government of Upper Volta requested CILSS to finance a food production project in the Eastern region of Upper Volta. This was followed by a meeting of the Voltaic government and the International Fund for Agricultural Development (IFAD) for an initial round of negotiation. In 1979, the French Central Fund for Economic Cooperation (CCCE), the United Nations Development Program (UNDP), and the United States Agency for International Development (USAID) joined IFAD, making the funding arrangement a multi-donor effort. Being anxious to move the process quickly<sup>1</sup>, IFAD offered to undertake preparation of the project design on behalf of the other donors. The project preparation document was prepared by FAO at the request of IFAD<sup>2</sup>. The report was later appraised by the African Development Bank<sup>3</sup>, and continued to be cited as "The

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<sup>1</sup>To meet the deadline for fund obligation.

<sup>2</sup>Rapport de la Mission de Preparation du Projet de Developpement Rural dans l'ORD de l'Est, Centre d'Investissement, FAO, 1980.

<sup>3</sup>Rural Development Project in the EORD: Appraisal Report, 1981.

Eastern Region Food Production Project (Projet Vivrier)".

In the process, however, the collaborative effort encountered several difficulties--such as differences among donors in programming cycles, analytical requirements of design, operating policies and procedures, etc. The inability to satisfactorily resolve such hurdles led USAID to define discrete project components for implementation during the same period.<sup>1</sup>

The first portion of this chapter has three objectives. First, it provides an overview of the overall IFAD-led EORD Food Production Project. Secondly, the elements of the proposed USAID/EORD Food Production Management Assistance Project will be briefly discussed. The third section will deal with the major issues raised by the MSU round table presentation made during August 1982 in Fada N'Gourma. In the second portion of the chapter, lessons learned from the 1974-1981 experience are summarized, followed by a brief assessment of the implications of Phase II to determine the extent to which Phase II design incorporated the lesson from the Phase I experience. Finally, the factors influencing the Phase II design effort will be explored, to draw some lessons for similar future multi-donor project design undertakings.

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<sup>1</sup>Eastern Region Food Production Management Assistance Project: Project Paper, USAID, 1981.

## 2. An Overview of Phase II: IFAD Proposal

### 2.1. Project Objective and Components

The two major objectives of this project are increased agricultural production by target households, and increased capacity of the EORD to implement its development programs. The priority zones selected for the project comprise four sectors out of the eight in the EORD: Bogande, Kantchari, Diapaga, and two subsectors of Matiakoali. The following are the main components of the project:

- The provision of short- and medium-term credit to buy production inputs, draft animals and equipment, and to establish cereal banks;
- the establishment of a Village Development Fund to finance community facilities such as small maternity hospitals, dispensaries, village wells, grain warehouses, and to stimulate village enterprises;
- the improvement of draft animal health through the rehabilitation and construction of vaccination units and the supply of vaccines;
- erosion control (5,000 ha) and also land development for rice cultivation on 1,000 ha of swampland;
- the strengthening of an agricultural production support centre, including a seed farm and applied research and training;
- the improvement and construction of rural tracks;
- the strengthening of the ORD through a reorganization

and a training programme for, e.g., supervisors and project staff and through the provision of technical assistance; and,

- monitoring and evaluation.

## 2.2. Project Costs and Financing Arrangements

The project is to be implemented over a period of 5 years at a total cost of 29.7 million dollars to be contributed from 5 sources. The details of the proposed financing plan is shown in Table 6.1. The largest contributions from CCCE and IFAD are given as loans. For instance, the terms of loan for the 14.5 million dollar contribution from IFAD is set for a 50-year period, with a 1 percent service charge per year excluding a grace period of 10 years.

## 2.3. Expected Project Impact

The FAO report (original project paper) anticipates significant physical and economic impacts from the proposed project. The project is expected to reach 8,000 farm families in the four sectors. It is anticipated, for instance, that the assistance results in increased annual crop production of approximately 12.5 percent over current ORD production to about 24,000 tons/year. The planned additional annual cereal production by the end of the project is broken down as follows:

<u>Crop</u>	<u>Tons</u>
Millet/Sorghum	6200
Maize	900
Rice	2300

TABLE 6.1  
FINANCING PLAN  
(US\$ million)

	IFAD	CCCE	UNDP	USAID	Govt.	Total <sup>1/</sup>
Credit						
a. Short Term	1.7					1.7
b. Medium Term		3.3				3.3
Village Dev. Fund	1.1					1.1
Veterinary Services		1.1				1.1
Lowland Dev.	2.5					2.5
Rural Tracks	3.4	1.0				4.4
Support Centre		3.0				3.0
Technical Assistance	1.4		2.0	0.7		4.1
Project Management	1.0				1.6	2.6
Extension Services	2.4	0.8				3.2
Monitoring and Evaluation	1.4			1.3		2.7
Total	14.9	9.2	2.0	2.0	1.6	29.7

<sup>1/</sup> Physical and price contingencies are included in the above figures.

Annual livestock production is also expected to increase by 200 tons by the end of the project. Other anticipated outputs of the project include:

- 208 kilometers of road
- an agricultural training unit
- 16 warehouses for agricultural input
- 30 cereal banks
- building administrative housing in the project

area

- financing 60 grain mills
- vaccination parks
- anti-erosion installation on 5000 hectares
- water control structure for 1500 hectares of

lowland

- establishing village development fund, etc.

The typical farming household which adopts animal traction and the other recommended innovations is expected to have a cash income of 675 dollars (after debt service) by the end of the project. The estimated overall internal rate of return for the project is about 20 percent. The export of products promoted by the project--such as cotton, ground nuts, and meat--would generate an annual foreign exchange of 3.2 million dollars, broken down as follows:

<u>Product</u>	<u>Value in \$</u>
cotton	1,200,000
ground nuts	1,600,000
meat	<u>400,000</u>
Total	3,200,000



In reviewing the overall project design, AID/Ouagadougou identified various discrepancies in programming systems between AID and IFAD. Nonetheless, the PID, which is the first of the necessary steps in AID's programming process in project approval, was arranged using information from the FAO document and the AFDB appraisal report as well as data from the on-going EORD project. But neither the FAO document nor the African Development Bank appraisal report, nor the combination of the two, fulfilled the requirements for an AID project paper. Hence, it became necessary for AID/Ouagadougou to mount an additional design effort to strengthen the document in order to present AID/Washington a proposal with sufficient detail to insure approval of the new Eastern ORD project. Aside from AID's reservation about the optimistic project outputs, other limitations of the IFAD-led project included lack of studies on environmental impact, social soundness, and range management, and lack of details on certain components such as the training program, recurrent cost financing, and the evaluation plan. For example, while IFAD's policy admits that an evaluation plan would be negotiated with the Voltaic government after negotiating the project itself, AID's approach requires an evaluation plan to be part of a project paper that would be negotiated with the government.

In February 1981, USAID/Ouagadougou representatives met with IFAD, UNDP, and CCCE representatives to discuss

USAID participation in the Eastern Region food production project. The major points of discussion revolved in the following areas:

- USAID was not in a position to commit funds to any component, due mainly to the lack of a project paper (PP).

- USAID would not be in a position to commit resources across the board because the project document (AFDB report) had not undergone the kind of analysis and planning which is needed for a PP. The prevailing differences and deficiencies could only be resolved by further technical analysis, not by high-level discussion.

- USAID would propose to AID/Washington that AID/Ouagadougou finance certain project components which could be justified on their own merit, and by analysis which could be completed quickly.

- In conformance with audit recommendations, the AID funding level would be reduced and there would be no further AID funding if the Phase I credit funds were not properly accounted for.

In reviewing project options, IFAD proposed that USAID finance lowland development, roads, or applied research, but did not agree to forego financing of monitoring and evaluation since it has particular expertise in this field. As USAID representatives also expressed interest, it was proposed that financing of this component be shared between IFAD and USAID. At the end of the meeting, however, it was clear to AID representatives that satisfying the

design requirement would entail pursuing further the idea of the discrete financing option.

### 3. The USAID/EORD Food Production Management Assistance Project

Following the February meeting, USAID/Ouagadougou decided to design an EORD Food Production Management Assistance Project. The three project components are high-level training, special studies, and technical assistance for evaluation, costing 3 million dollars during the life of the project. Tables 6.2, 6.3, and 6.4 provide the indicative budget for the training, special studies, and evaluation components respectively.

### 4. Michigan State University Round Table Proposal

From July 26-28, 1982, a round table meeting was held in Fada N'Gourma to discuss the major research findings of the EORD/IRDP. The meeting was sponsored by the EORD's Bureau of Economic Analysis and Planning and the GOUV Ministry of Rural Development. Four members of the MSU technical assistance team members attended the meeting and discussed the main findings from both the socio-economic and the regional planning studies. The summary presentations and recommendations for future programs are reported by Lassiter, et al.<sup>1</sup>

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<sup>1</sup>The report is entitled Applied Research in Eastern Upper Volta: Major Findings and Recommendations for Future Programs, August 1982, by G. Lassiter, A. Mehretu, and D. Wilcock.

TABLE 6.2  
INDICATIVE BUDGET FOR AID PROJECT (\$)

	LC	FX	FX (contractor)	TOTAL
I. TRAINING COMPONENT				
A. In-country short-term				
1. CESAO (8 trainees)	10,000			10,000
2. E.ORD (2 1-mo seminars)	50,000			50,000
3. Training Seminars (2 6-week)	15,000	45,000	45,000	60,000
4. Training & Evaluation Mission (4 sessions, 6 weeks each)		60,000	60,000	60,000
5. National Seminar	10,000	10,000	10,000	20,000
B. In-country long-term (2 trainees)	60,000			60,000
C. Out-of-country short-term (4 trainees)		40,000	40,000	40,000
D. Out-of-country long-term				
1. 4 trainees, West Africa	100,000			100,000
2. 3 trainees, U.S.		225,000		225,000
E. Physical & Price (10%) <sup>a</sup> Contingencies		175,000	50,000	175,000
TOTAL Part I	245,000	555,000	205,000	800,000

<sup>a</sup>Price contingency = \$75,000, based on projected timing of inputs

SOURCE: USAID, 1981

TABLE 6.3  
INDICATIVE BUDGET FOR AID PROJECT (\$)

	LC	FX	FX (contractor)	TOTAL
II. SPECIAL STUDIES COMPONENT				
A. Surveys	100,000	50,000		150,000
B. Farming Systems	200,000	50,000		250,000
C. Regional Planning & Marketing	100,000			100,000
D. Adoption & Social Impact	50,000			50,000
E. Environmental Impact	75,000	75,000		150,000
TOTAL Part II	525,000	175,000		700,000

SOURCE: USAID, 1981

TABLE 6.4

## INDICATIVE BUDGET FOR AID PROJECT (\$)

	LC	FX	FX (contractor)	TOTAL
III. TECHNICAL ASSISTANCE COMPONENT				
A. Long-term Advisors <sup>a</sup>				
1. Agronomist/Team Leader (3 years)		390,000	390,000	390,000
2. Sociologist/Anthropologist (2 years)		260,000	260,000	260,000
3. Economic Geographer (2 years)		260,000	260,000	260,000
B. Short-term Advisors <sup>a</sup>				
1. Training Expert (10 months)		80,000	80,000	80,000
2. Environmental Scientist (6 months)		50,000	50,000	50,000
C. Facilities & Back-up Support	100,000	129,000	129,000	229,000
D. Local Staff	150,000		0	150,000

TABLE 6.4-Continued

	LC	FX	FX (contractor)	TOTAL
E. Short-term Technical Assistance for Project Mid-term Evaluation		45,000		
F. Price Contingency		100,000	100,000	100,000
TOTAL Part/II	250,000	1,250,000	1,205,000	1,500,000
GRAND TOTAL	1,020,000	1,980,000	1,410,000	3,000,000

<sup>a</sup>encumbered salaries/benefits and international travel.

<sup>b</sup>not part of Technical Assistance Contract.

SOURCE: USAID, 1981

The results of the micro-economic study indicate that, as of the 1978-79 season, the farming systems in the Eastern Region are characterized by low levels of productivity and monetization<sup>1</sup>, and high variability in production conditions such as rainfall patterns, soil fertility, etc. Similarly, the results of the regional planning study have also revealed, among other things, detailed structural characteristics of the Eastern Region<sup>2</sup>:

- Lack of spatial association between population pressure and physical resource potential--the southern region of the ORD, which is rich in physical resources (precipitation, river discharge, vegetation cover), is the least inhabited.

- The region is one of the least densely populated areas of Upper Volta, with a mean density of about 8 persons/km, but the population of the region resides in only about 30 percent of the area in densities varying from 10 to 80 persons per square km.

- Assuming that areas within a ten kilometer corridor on each side of a road have accessibility, only 15 percent of the region is accessible to all-weather roads. The total length of all roads and trails is about 2823 kilometers. Most of these roads, however, are not motorable

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<sup>1</sup>Many of the factors associated with poor performance of the EORD agricultural production and marketing activities are discussed in parts of Chapter V and VI.

<sup>2</sup>For details of the structural characteristics of EORD, see Mehretu, 1982.



in the rainy season. Based on the above assumptions, about 37 percent of the region is accessible to these roads.

- Of the total number of school-age children, 7.8 percent are enrolled in elementary school. This represents about half of the national average. The Fada, Diapaga and Bogande areas account for over 55 percent of the region's total enrollment although they have only about 30 percent of the population.

- As measured by an effective service radius of 5 km, only about 4 percent of the region's total area is within easy access to the 27 dispensaries, maternities, and hospitals located in 25 villages.

- Although 80 percent of villages surveyed reported having water supply wells, only 60 percent reported wells with water in them all year long. Thirty-nine percent of the wells have water all year round. Ninety percent of the villages reported that during the dry season they go from less than 1 to 2 km distance to fetch water; 10 percent reported going 3 kilometers or more.

- The region has 178 village markets, 52 of which serve populations in other villages besides their own. About 27 of these markets have a significant level of centrality, serving 5 or more villages.

Based on such research findings, the Michigan State University technical assistance team members drew the following conclusions:

- A. EORD does not possess a set of technical packages

which are biologically stable and economically profitable at the farm level for the vast majority of rural households. The ANTRAC package which is available is not well adapted to farm conditions.

B. The time required to develop a self-sustaining animal traction program was seriously underestimated. The development of an animal traction technology and basic support services is a complex, long-term process.

### 5. Synthesis

As noted in Chapter II, the Phase I project of the EORD was formulated with a two-fold purpose. First, to expand the capacity of the EORD to design and implement development projects and, secondly, to increase food production, food security and income of the rural people in the Eastern Region. As the project moves into a second phase, the project components are identified as a follow-up to the activities of Phase I, defining its purpose to be the achievement of the same early project goals. While the funding of the IRDP was about 4 million dollars, coming from a bilateral arrangement with USAID, the Phase II project is supported by a budget about eight times larger, contributed by five participants, including the GOUV. The multilateral donor financing arrangement has elevated the amount of financial backing for the ORD's projects.

As pointed out earlier, the main activity of the IRDP has been institution building--with about 90 percent of project financial resources allocated to ORD operations

through technical assistance, commodities, construction, training, etc. Nonetheless, the first phase project has not succeeded in developing the capacity of the region, nor in securing a viable agricultural production package.

Once the Voltaic government and the international donors agree to maintain a funding priority to increase food production, food security, and income among the rural people, the project preparation team needs to focus on designing a program with self-sustaining potential. The first step in accomplishing the design of a Phase II activity requires setting a clear project objective, and then conducting a systematic analysis of the region to determine the limitations and possibilities of approaching the desired objectives. From this perspective the accumulated experience from Phase I activity is indispensable in designing and implementing a solid Phase II program.

#### 5.1. Lessons From the 1974-1981 Experience

As pointed out in Chapter I, the purpose of this study is to see what we can learn from the 1974-1981 experience to help the EORD and the government of Upper Volta, as well as donors wishing to provide development assistance, in the preparation of similar future projects. The various data accumulated on the activities of the integrated rural development project are capable of generating multifaceted policy implications useful in guiding similar future undertakings. The following are some lessons to be learned from the EORD/IRDP experience.

A. In spite of the effort exerted through the IRDP financial and technical assistance, the EORD does not have the capacity to:

- coordinate regional development activities--agriculture, health, education, public works, etc.
- deliver support services for even the more focused agricultural development program--credit, extension, research, and product marketing
- motivate and manage its personnel, and handle its financial resources to satisfy donor requirements
- generate adequate self-supporting revenue from its commercialization activity to cover its recurrent cost requirements.

B. The EORD/IRDP has not succeeded in stimulating small farmer investment in food production mainly because:

- EORD/IRDP does not possess viable technical themes suitable to the diverse agro-climatic conditions characterizing the region
- priority investment was allocated to institution building for capacity development largely at the headquarters--on vehicles, construction, equipment for ORD, budget support, etc.

C. Uncoordinated multidonor intervention, particularly involving donors on different operating schedules and reporting requirements, not only aggravates the management problem for the host country agency but can adversely affect overall project results if individual donors fail to

implement planned intervention.

D. A project with the magnitude of EORD/IRDP can greatly benefit from instituting a management information system to assist management in assessing implementation and technology, as well as in checking the flow of expected benefits to the target population or area.

Several specific lessons have also been learned in pursuing the performance of the individual components of the IRDP. For instance, in the agricultural credit scheme, the interest rate for medium-term credit was 5.5 percent, at a time when inflation was in the 12 to 15 percent range. As a result, there was a 10-fold increase in the borrowing of animal traction credit during the 1974-1981 period. But in the absence of a viable production package and the inability of the EORD administrative framework to furnish the necessary support services, the credit repayment rates are low and farmers are constantly faced with severe cash flow problems. Moreover, by giving loans at a low rate of interest, the credit program also undermined efforts to mobilize rural savings in the region.

Two policy implications emanate from the credit experience. The first implication suggests that planners and policy makers should develop a sound food production package before encouraging wide distribution of subsidized credit. In the light of prevailing EORD circumstances, this implies the need to improve the scientific base by investing in research and training.

The second implication suggests the need to raise the interest rate in line with the opportunity cost of capital. It appears that the policy makers in Upper Volta have learned this lesson; they recently agreed to raise the interest rate for the medium-term loans. But there should be a concerted effort to mobilize rural savings by raising interest rates on saving accounts.

The product marketing effort of the IRDP has not been satisfactory. First, the ORD's marketing program handled only an insignificant volume of the region's farm products. Even then, the operation was conducted at a loss, basically due to its high operating costs. Subsequently, though self-financing in principle, the ORD is characterized as a drain on the national budget and its persistent recurrent cost problem is mostly met by continued financing by varied external donors.<sup>1</sup>

### 5.2. Implications of Phase II

In assessing the IFAD-led project paper, one can easily observe that the designers have by and large overlooked certain lessons from the Phase I experience. The subsequent design by the USAID team, which defined a discrete Eastern Region Food Production Management Assistance Project, has raised many of the issues that were overlooked and tried to incorporate the Phase I experience in the Phase II project

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<sup>1</sup>Lassiter, et al., 1982 reports that EORD has received zero funding from GOUV in the past two years.

design. However, the link between the USAID project components and the IFAD-led program is still undefined.

#### 5.2.1. Technical Package

The IFAD proposal is based on the assumption that a package of improved practices exists and that farmers are receptive to the introduction of this technology.<sup>1</sup> However, this assumption is not in line with the performance of the IRDP over the 1974-1981 period. For instance, the crop yield figures used in the IFAD project paper are highly optimistic when compared with the household production data generated in the 1978-79 farm survey by the MSU team. As shown in Table 6.5, the yield estimates (kgs/ha) for the major crops in the IFAD paper are significantly higher than the figures presented in Table 5.3. In Table 6.5, Stage I estimates represent the level without the project. Stage II yields are anticipated to result from better soil preparation, use of improved seeds, fertilizers, and insecticides or pesticides; likewise, Stage III yields are attributed to the use of more fertilizers and more appropriate rotation systems around selected cash crops.

Based on such hypothetical yield figures, the anticipated effects of the project also appear overly optimistic. For example, the African Development Bank estimates that over the life of the project annual household

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<sup>1</sup>Upper Volta Rural Development Project in the EORD: Appraisal Report, 1981.

TABLE 6.5

YIELD ESTIMATES (kg/ha)

	Stage I (Without Project)		Stage II		Stage III	
	With Animal Traction	Manual	With Animal Traction	Manual	With Animal Traction	Manual
Sorghum	0.8	0.7	1.1	0.9	1.3	1.1
Millet	0.7	0.6	1.0	0.8	1.2	1.0
Groundnuts	0.6	0.5	0.9	0.8	1.2	1.0
Maize	1.2	1.0	1.7	1.4	2.4	2.0
Cotton	-	-	0.9	-	1.0	0.9
Cowpea	0.2	0.2	0.4	0.4	0.7	0.7
Rice	-	-	-	-	1.5	1.5

Source: FAO, 1980



income in target households would increase from 110,000 FCFA to 242,000 FCFA in households using animal traction and to 198,000 FCFA in households cultivating by hand. The IFAD paper also assumes an average of 5 persons in the household instead of the 7-11 persons observed in the EORD/IRDP sample households.

As reported in Chapter V, a series of 10-year investment analyses based on different levels of technology shows that there is a large initial investment cost and deferred benefit associated with the adoption of the existing animal traction package. This analysis shows that, for level of technology represented by the complete tillage plus fertilizer application package for donkey and oxen traction, the first four years of the investment period are represented by deficit incremental net benefits. In both instances, higher levels of positive incremental net benefits are generated late in the investment period (see Lassiter, 1982).

The total net incremental benefits for the different levels of assumed technology become minimal in accounting for the relative timing of costs and benefits over the investment period. Table 6.6 shows the net present value (NPV) of the incremental benefits calculated at three interest rate levels. The zero rate shows the incremental benefits without regard to the time value of money. The 5.5 percent discount rate is used to reflect the opportunity cost of ANTRAC investment credit. As discussed earlier, the

TABLE 6.6

THE NET PRESENT VALUE OF THE INCREMENTAL BENEFITS OF ANTRAC  
BASED ON 10 YEAR INCOME PROJECTIONS

Level of Technology	NPV of Incremental Net Benefit for:		
	No Discount Rate	5.5% Discount Rate	10.0% Discount Rate
Donkey Plow, No Production Effect	-133,225	-105,267	-88,811
Donkey Plowing, With Production Effect	88,080	59,283	43,740
Complete Donkey Tillage	172,890	114,736	83,447
Complete Donkey Tillage + Fertilizer	213,965	157,590	117,250
Oxen Plowing, No Production Effect	-39,950	-70,365	-80,992
Oxen Plowing, With Production Effect	96,819	28,826	-2,763
Complete Oxen Tillage	74,749	78,214	31,784
Complete Oxen Tillage + Fertilizer	304,539	170,416	103,242

SOURCE: Lassiter, 1982

1978-79 medium term loan for animal traction farmers was given at 5.5 percent interest. The 10 percent discount rate is chosen as a more likely representative interest rate for loans given by alternative institutions. As shown in the table, the incremental benefits are reduced by applying the discounting procedure. The higher the discounting rate, the more the incremental net benefit is reduced. For instance, the 96,000 FCFA net benefit without discounting has no incremental net benefit at a 10 percent discount rate.

The annual expected recurrent cost burden to be generated by the project is about 4 times the state tax revenue. During the life of the project, donors pay 25 percent of the salaries of central ORD staff and contribute to general operating expenditures of the ORD, including the financing of additional office buildings at ORD headquarters. A list of Voltaic personnel to be financed by the project is presented in Table 6.7. In the long run, increased income from agricultural production is expected to stimulate an increased tax base. This, coupled with a better system of tax collection, is hoped to generate sufficient revenue to cover project maintenance costs. However, in the light of the unsatisfactory technical package at the farm level, the project is unlikely to generate the expected output and income base in the immediate post-project period, implying the need to explore all other possible avenues of local revenue generation.

TABLE 6.7  
VOLTAIC PERSONNEL FINANCED BY THE PROJECT

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ORD administration:	
25% of general staff time	
Accountants	2
Clerks	6
Agricultural Support Center:	
Center Director	1
Deputy Center Director	1
Assistants	8
Extension Service:	
Sector chief assistant	8
Extension agents	53
Road Brigade:	
Work site chiefs	2
Skilled laborers	3
Manual laborers	6
Livestock Health:	
Nurse	1
Vaccinators	10
Drivers	2
Manual laborers	4
Lowland development:	
Topographer	1
Assistants	2
Driver	1
Monitoring and Evaluation:	
Enumerators	5

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Source: FAO, 1980

### 5.2.2. Agricultural Support Center

The Phase II project intends to develop an agricultural support center in Diapaga sector. The planned budget allocation for the support center is about 3.3 million dollars. The main expenditure items include: construction and equipment of offices, laboratories, a lecture room, warehouses, a garage, a workshop, housing for center staff and trainees, as well as vehicles and their operating expenses. The location of the support center in the proposed EORD organizational framework is presented in Figure 6.1. The three activities of the proposed agricultural support center are seed multiplication, applied research, and training.

#### 5.2.2.1. Seed Multiplication

The seed multiplication program is considered as a follow-up to the on-going CCCE-financed seed program in the EORD. The current project expands the facilities to produce seeds to satisfy demands for maize, sorghum, millet, and rice seeds. The seed multiplication effort is to be supplemented with a network of plots for field trials.

#### 5.2.2.2. Applied Research

The main focus of the applied research component is to coordinate the regional research effort of the International Research Centers found in the country. Among these institutions are CERCI, on irrigated crops,

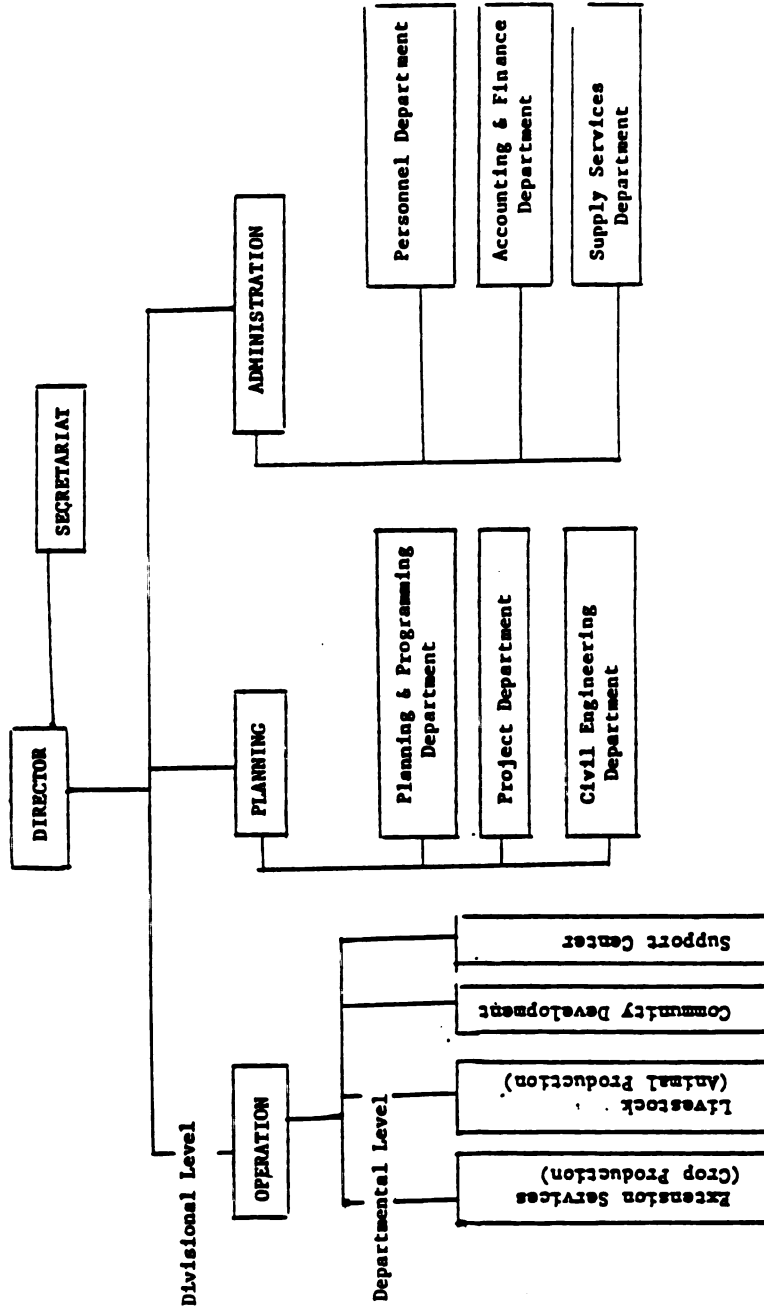


Figure 6.1. Proposed EORD (FADA N'Gourma) Organizational Chart

particularly rice; IRCT, for cotton; IRAT, for cereals; and ICRISAT on general agronomic practices. While the IFAD proposal wishes to maintain a distinction between the applied research and the evaluation activities, the MSU round table proposal emphasizes the need to orient the applied research activity within the farming system framework. The USAID proposal, for instance, indicates the existence of ample research opportunity in connection with the evaluation activities of the proposed evaluation unit. The \$700,000 funding by USAID for special studies is based on such a premise.

#### 5.2.2.3. Training

The agricultural support center anticipates training project staff, extension agents, and farmers. Other than the plan to recruit a Senior Training Officer to coordinate all training activity, the project paper does not treat the kinds of skills provided to the different participants in the training activity.

The AID proposal also defines a follow-up to the Phase I training program, a high-level training activity supported by a budget of \$800,000. In contrast to Phase I, this budget is a substantial increase over the original \$200,000 allocation. However, in spite of the need for accelerated training activities, only about 10 percent of the allocation was expended during the Phase I period, mainly because of limitations on timely identification of capable candidates as well as in making the necessary

logistical arrangements on the side of both ORD and USAID representatives. The current proposal anticipates minimizing such problems by encouraging increased participation of the MDR's Directorate of Planning, Human Resources and Professional Training over the process of identifying candidates and scheduling training periods. This proposal further identifies the likely training institutes for short- and long-term training both in the country and abroad. However, in light of the fact that the UNDP Senior Training Officer is charged with the responsibility of managing the overall Training activity, there is no clear mandate defining the role of the USAID project personnel in implementing the USAID Phase II training component.

#### 5.2.3. Agricultural Extension

According to the proposed organizational structure of the EORD (see Figure 6.1), the extension service will be located in the operations division as a department. The main thrust of the planned extension activity is the Training-Visit (T&V) system of extension. The training activity of the extension program is to be headed by a senior training officer provided through UNDP technical assistance. The senior training officer will be assisted by subject matter specialists and agricultural officers to form the hierarchial system of supervisory and training teams to ensure that village extension workers carry out their visits with farmers on a regular basis. Problems not



adequately treated in the IFAD project paper, but likely to arise during implementation, include a shortage of qualified personnel to assume duties at the various levels, as well as logistical problems emanating from the poor transportation network characterizing the Eastern Department.

#### 5.2.4. Agricultural Marketing

As in the case of the presupposition of viable package availability, the IFAD-led project states that the existing marketing network is capable of collecting and distributing the anticipated production surpluses to be generated by the project<sup>1</sup>. While it relies on OFNACER for marketing cereals, and on CFDT for marketing cotton, the extra production of ground nuts and niebe are to be absorbed through increasing processing capacity in rural areas. For improving rice marketing, the AFDB report proposes the following conditions to be pursued by SOVOLCOM:

- SOVOLCOM will be committed to purchasing the paddy delivered to Fada N'Gourma (the collection will be ensured by the traditional system)

- The Equalization Fund<sup>2</sup> (Caisse de Perequations) will agree to subsidize the additional transport costs, which will amount to about 14 francs per kg for the EORD.

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<sup>1</sup>Given the nature of the technological base assumed, surplus production may not be generated and no subsequent pressing marketing problems may follow.

<sup>2</sup>Refers to subsidization of transport of local rice from where it is produced to milling and final point of sale; fund is to come from the rice import tax.

As discussed in earlier chapters, however, the current performance of product marketing in the Eastern Region is quite unsatisfactory. For instance, Fotzo, 1983, describes rice marketing in the EORD as follows:

In fact, in 1980, the regional director of OFNACER for the Eastern Region suspended all the paddy buying operations from his program because of inadequate storage and processing facilities. Throughout the whole EORD, only two small processing units (130-160 kg of paddy per hour) were in operation during the survey period. This scarcity of processing units coupled with the fact that batches of paddy were not homogenous resulted in a poor quality of milled rice (60 percent of broken rice), making the imported rice preferred to domestic rice.

#### 5.2.5. Monitoring and Evaluation

The IFAD-led project intends to establish a monitoring and evaluation unit in the ORD's headquarters in Fada N'Gourma. The unit will be independent in its advice to ORD management and donors, but will be accountable to the Ministry of Rural Development (MRD). The procedures of operation are to follow IFAD's guidelines, and will be directed by a long-term technical advisor funded by IFAD. The anticipated office construction to house the unit is also to be financed by IFAD.

As described earlier, AID provides short- and long-term technical assistance in various fields. The purpose of AID's technical assistance is to improve monitoring and evaluation of the multi-lateral program management and impact, and to inform the use of AID training and special studies components.

Under IFAD's guidelines, the MEU has two main functions. The first function is to follow the program's receipt of funds, technical assistance, and commodities from the donors projects and the GOUV and to record the results of program activities. The second function is to assess the effect of program output and the impact of these effects on food production, income and the quality of life in the target group.

The establishment of a monitoring and evaluation unit is not at issue. In fact, one obvious limitation of the Phase I project was the lack of a built-in evaluation mechanism to continually assess project activity. The types of evaluation tasks outlined in Chapter II, such as farmer assessment, implementation assessment, and gauging benefit flows, although they require a coordinated information system, are likely to contribute to the success of the project, particularly if accomplished in a systematic and timely manner.

Indeed, the current effort in Phase II to institute an evaluation mechanism is an improvement over Phase I. However, a close examination of the proposed structure suggests the need to further redefine certain aspects of the MEU in order to ensure its implementation on a sustainable basis:

- Although funds are allocated for applied research, special studies and monitoring and evaluation components, the proposed structure is not conducive to facilitating

coordinated and effective implementation of an evaluation program to conduct farmer assessment, implementation assessment, and gauging of benefit flows.

- The proposed independence of the MEU from the ORD is likely to promote objectivity in evaluation, and the hook-up with MDR could facilitate micro- and macro-policy linkages; but the ORD may not approve the recurrent expenditures to maintain such a structure at the end of the project.

- At the end of Phase I, several vacant offices were released at the ORD headquarters in Fada; these could accommodate many of the Phase II project components. How justifiable will it then be to use project funds for further office construction?

### 5.3. Collaborative Project Design Minimizing Pitfalls

It is obvious by now that the Phase II project which started as a bilateral project has evolved over time into a multidonor project involving five donors, including the Government of Upper Volta. In tracing the evolution of the project, however, it has also been demonstrated that accomplishing a collaborative design, although highly desirable, is not found to be a simple task.

Many factors contribute to the apparent difficulty. The primary factors is the inability of participating donors to judge and appreciate the strength and limitations of each other's operating policies and procedures in the light

of the problems at hand. In general, for instance, while bilateral agencies are known to be limited by their own governments, auditors, and public opinions, multilateral agencies are constrained by their own financial and administrative structure. Subsequently, as observed in the case of Phase II design process, AID's persistence in basing the project paper on a solid data base, stemming from the programming cycle and analytical requirements inherent in its procedures, has not been adequately appreciated by the IFAD representatives, who saw meeting their funding obligation deadline as the foremost priority. Even though the challenges of collaborative design are likely to continue, given that different donors maintain different requirements, making some provisions at earlier stages of the design effort can assist in overcoming certain pitfalls:

- Donor representatives entering into the design effort should be individuals adequately aware of each others' requirements and procedures.

- It is essential that one criteria of collaborative design be required representation and full participation by all collaborators in the design process.

- The ultimate success of the design, to a large degree, depends on the extent to which the design effort attempts to deal with the key constraints prevailing in the environment under consideration. In the case of the Eastern Region, for instance, the factors include the lack of improved technology, shortage of trained manpower, and

lack of operating cost for recurrent expenses. Host country representatives play a useful role in the harmonization process, provided that host institutions possess some desirable level of capacity.

## 6. Summary

The Phase II EORD program consists of two projects: the overall IFAD-led project (with less early USAID planned contribution) and the USAID/EORD Food Production Management Assistance Project. Both projects are to be implemented during the 1982-1987 period.

The overall IFAD-led project, having the same goal as the Phase I project, intends to expand the capacity of the EORD and to increase food production, food security, and income of the rural people in the four sectors of the Eastern ORD. The project anticipates a 27.7 million dollar contribution from four participants: IFAD, CCCE, UNDP, and the government of Upper Volta. The funds from IFAD and CCCE are largely loans, while that of UNDP are on a grant basis. The 14.5 million dollar contribution from IFAD, for instance, is given as a loan for 50 years, with a 1 percent service charge per year excluding a grace period of 10 years. The project is expected to reach 8,000 farm families in the project area. Anticipated physical results of the project include: increased annual crop production of approximately 12.5 percent, 208 kilometers of roads, 30 cereal banks, 60 grain mills, a training unit, etc. The typical farming household which adopts animal traction

and other recommended innovations is expected to have a cash income of 675 dollars by the end of the project. The estimated overall internal rate of return for the project is about 20 percent, and the export of project-produced agricultural products would generate an annual foreign exchange of 3.2 million dollars.

The second project, the USAID/EORD Food Production Management Assistance project, resulted because the IFAD-led project paper was found inadequate to fulfill the requirements of an AID project paper. When the IFAD representatives refused to engage in further analysis, AID representatives decided to define a discrete project. Its three major components are high-level training, special studies, and technical assistance for evaluation, costing 3 million dollars during the life of the project.

In an attempt to draw some lessons for Phase II, major findings of the MSU micro-economic and regional planning study results were briefly reviewed. For instance, the EORD is characterized by its low levels of production and monetization, high variability in rainfall patterns and soil fertility, lack of spatial association between population pressure and physical resource potential, etc. Subsequently, some lessons to be learned from the 1974-1981 EORD/IRDP Phase I experience have been outlined:

- That EORD/IRDP does not possess viable technical packages suitable to the diverse agro-climatic conditions characterizing the region.

- That the EORD not only lacks the capacity to motivate and manage its personnel, but is also unable to effectively deliver support services for even its more focused agricultural development programs.

- That instituting a management information system can contribute to the success of a project, particularly if systematically used for assessing not only routine implementation tasks but also farm technology, as well as the flow of expected benefits to the target population or area.

- That uncoordinated multidonor intervention not only aggravates the management problem for the host country agency, but can adversely affect overall project results if individual donors fail to implement planned intervention.

- That the period from 1974-1981 is quite short to allow the evolution of project impact beyond that of physical construction.

Other specific lessons and subsequent policy implications emanating from the performance of the individual components of the IRDP, such as the agricultural credit and product marketing activities, have also been presented.

In assessing the IFAD-led project paper, it is observed that the designers failed to incorporate significant lessons learned from the 1974-1981 experience. For example, the IFAD proposal assumes that a package of improved practices exists for the region, contrary to the



reality reflected by the various indicators of the 1974-1981 experience. The crop yield figures used in the IFAD project paper, perhaps pulled from experiment station trial reports, are highly optimistic when compared to the 1978-79 farm-level data. Aside from the unrealistic expectations embedded in the revenue figures, the return calculation also overlooks the fact that there is a large initial investment cost and deferred benefit associated with the adoption of the existing animal traction package. As a 10-year investment analysis shows, the first four years of the investment period for oxen traction and the first two years for donkey traction are represented by deficit incremental net benefits. In both instances, higher levels of positive incremental net benefits are generated late in the investment period.

The expected export tax revenue to accrue to the central government amounts to about 250,000 dollars per year. But the annual recurrent cost requirement of the project goes as far as 1,000,000 dollars per year towards the end of the project. In the short run, 25 percent of the salaries of central ORD staff and some operating expenditures are to be picked up by the donors. However, adequate provisions are not made to explore all other possible avenues of local revenue generation to sustain the development effort at the end of Phase II.

The final portion of the chapter discusses the strengths and limitations of other elements of the project,

which are of concern to both the Voltaic government and the donors, such as the proposed support center, agricultural extension, agricultural marketing, and the monitoring and evaluation unit. Then the factors that contributed to the impasse in the Phase II collaborative design process are examined, followed by some suggestions for consideration to facilitate harmonization in similar future undertakings.

## CHAPTER VII

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

#### 1. Concluding Summary

Upper Volta is one of the poorest countries in the world. Its Gross National Product in 1979 dollars was \$180. Its predominantly rural economy (agriculture supports 90 percent of the population) is characterized by a low level of productivity. The annual average growth rate of agriculture in Upper Volta was negative (-3.3 percent) in the 1970-1979 period. In the same period, the food production index declined about 13 percent.

As one of its first drought recovery projects in the Sahel, USAID financed a \$4.4 million integrated rural development project (IRDP) in the Eastern region of Upper Volta (EORD/IRDP). Additional funds were also contributed by numerous donors, including UNDP. The USAID financing was intended to provide appropriate technological packages to small farmers and herders. Its components were envisaged to include programs for: strengthening the region's extension and marketing activities, providing facilities, improving wells water control, farm-to-market roads, range management, and promoting increased food production and better diets (Cohen, 1979).

The EORD/IRDP was a major joint undertaking by USAID and the EORD. Its objective was to expand the ORD's administrative capacity and to increase agricultural production and rural income in the Eastern Region. The project was designed with the intent to create "centers of progress" for intensive programs, and thereby to experiment with provision of concentrated extension and related supporting services. However, operational problems curtailed implementation of the concept. Consequently, ORD-wide applied research and implementation programs were undertaken by the Michigan State University technical assistance team from May 1977 until June 1981.

The main focus of this study is to assess the overall performance of the EORD/IRDP in institution building and stimulating agricultural production in the area. The ultimate purpose is to outline lessons learned during the 1974-1981 experience. The specific objectives of the study are to:

- a. identify and analyze the methodological issues involved in evaluating integrated rural development schemes;
- b. assess the role of the individual EORD/IRDP components in institution building;
- c. evaluate the impact of the EORD/IRDP on agricultural output, income, and equity objectives;
- d. examine the viability of the proposed Phase II EORD food production program (1982-1987).

The two primary sources of data for the present study are the Base Line Farm Survey and the Inventory of Village Socio-Economic Characteristics of the Eastern Region. These surveys were carried out in 1978-1979 and early 1980, respectively, by MSU teams in collaboration with EORD staff.

The credit program, comprising short-term and medium-term credit was the centerpiece of the various programs undertaken to expand food production, food security, and income in the Eastern Region. It assumes that the provision of credit would allow farmers to purchase donkeys, oxen and animal traction equipment in order to expand farm size and increase food production and farm income. The average interest rate for short-term credit is about 12 percent; the interest rate for the medium-term loans was 5.5 percent until it was changed by CNCA to 11 percent in late 1980. The oxen loan package is to be repaid in a five-year period with one year's grace, in three equal installments of 20 percent and a final payment of 40 percent of the total loan. The donkey package is given for four years, with a one-year grace period and equal repayments in Years Two, Three, and Four. There are several stipulations, such as down payment requirements, profitability of operations, group membership requirements, etc., governing the distribution of credit to the farmers. Over the 1976/76 - 1980/81 period, a total of 4843 loans were extended to 9282 families, accounting for about 15.5 percent of the families residing in the Eastern Region.

Despite the continued effort to alleviate the existing problems, the average loan repayment rate was 32 percent during the 1976/77 - 1980/81 period. The poor performance of the credit program is associated with several problems emanating from the central administration of the ORD as well as from the field level. However, as cited earlier, the lack of a viable technical package represents the major shortcoming of the EORD's credit system. Subsequently, even the relatively larger farmers adopting the animal traction program experienced a severe cash-flow problem. Among the achievements of the credit program is the development of a rural credit account to facilitate proper accounting of cash flow, and initiation of management procedures capable of producing statistical data useful in improving the management process. Nonetheless, there is still a great need to refine the accounting procedure so that an income statement and a balance sheet can be prepared to ascertain the viability and/or net worth of the credit program periodically. In the final analysis, however, development of a self-sustaining rural credit program in the EORD entails initiating and carrying out an effective savings mobilization activity.

It is also pointed out that the agricultural extension system of the EORD has grown rapidly from 47 field agents in 1974 to 171 in 1980. But the extension network is characterized as a one-way system, devoted to transmitting the available technical theme to the farmer. Above all, it lacks a systematic research program and feedback mechanisms

for incorporating farmers' views and ideas in the decision-making process.

The marketing operations of the EORD/IRDP were initially focused on the purchase and sale of crops. It is indicated that this activity was carried out during the 1977/78 to 1980/81 period at a financial loss to the EORD. Thus, the intent to generate revenue for the ORD from the commercialization activity has not materialized. Consequently, the EORD has gradually relieved itself of the crop purchasing and selling activity. However, the ORD has continued its involvement with grain banks even though the management of cereal banks faces various problems. The rate of repayment, although better than animal traction credit rates, averaged only about 60 percent during the 1978-1980 period. Some limitations of cereal bank management in the EORD include poor transportation facilities, inadequate stocking capacity, unstable prices, lack of market information, a poor extension network, etc.

The socio-economic study has generated a vast amount of data covering various areas. Over the 1978-1981 period, 72 reports were produced, covering a wide range of topics: agricultural credit, farming systems, agricultural marketing, regional planning, small-scale enterprises, etc. (A lot of raw data remains in the computer files, still waiting to be analyzed.)

The assessment of the technical and economic effects is based on the 1978-79 farm level data and subsequent studies

completed by the EORD/IRDP technical assistance team. With respect to the area expansion effect, for example, the data indicate that, using the actif/area ratio as an indicator, the area cultivated per actif is over 10 percent larger for animal traction farmers as compared to hoe farmers. The increase in acreage per worker was larger for traction farmers who used ANTRAC for both plowing and weeding. With respect to household labor allocation, the survey data indicate a reduction in field labor use per hectare for animal traction farmers. Even though traction farmers tend toward growing more cash crops and allocate a greater proportion of their time to livestock raising and agricultural trading, both ANTRAC and hoe farmers devote 75 to 80 percent of their land to sorghum and millet.

With the exception of corn and groundnuts, the yield increase per hectare has not been significant. However, because of a multitude of factors--such as inadequate control, limitations of use of average yields, incomplete techniques, and the effects of drought--the yield difference between hoe and animal traction farmers is insufficient to provide conclusive evidence of this impact of the animal traction program.

Farm-level incomes in the EORD are derived from various sources: crop production, livestock raising, crop and livestock trading, crop processing, as well as other sources such as pensions, inheritance, and cash gifts. Based on the 1978-79 study, the income effects of animal



traction at the farm level were found to be negligible. Oxen farmers attained a 16 percent increase in net farm income per active worker from crop production. Donkey traction farmers' incomes were found to be lower than those of hoe farmers in the same zones.

The cost effects are found to be significant, particularly for the traction farmers. For instance, 18 cents per dollar of the gross crop enterprise income is spent on variable and fixed costs by oxen traction farmers. Similarly, 26 and 9 cents per dollar of gross crop enterprise income are spent by donkey traction and hoe farmers respectively. The income from crop production has not been adequate to cover the various categories of expenditure. In the two zonal aggregates of hoe cultivation, the cash inputs were found to be 28 percent of the value of sales. The cash costs comprised 67 and 24 percent of crop sales for the oxen and donkey traction farms, respectively. Thus, the magnitude and timing of production costs poses a serious cash-flow problem, particularly for oxen traction farmers. To be successful, the traction adopters are obliged to discover and use alternative sources of liquidity, such as the sale of livestock, and non-farm cash sources including formal and informal credit.

As indicated by the various technical and economic indicators, the project performance during the 1974-1981 period reflects a significant gap between the expected and

the realized outcomes. However, results of on-farm trials and budget analysis suggest an encouraging prospect and a scope for inducing adjustments in policy and operating practices to facilitate increased long-run farm-level returns for the smallholder farmers in the region. It is also noted that the technical themes delivered to the farmers, as practiced currently, are incapable of generating satisfactory returns. Moreover, due to lack of an ongoing farm research program, there is no space-specific technical information to maintain an effective farmer/extension agent/researcher linkage within the EORD system. Similarly, several shortcomings of the policies and operating practices of the EORD have been noted, illustrating its inability to provide the necessary support services required to facilitate increased output and income of smallholder farmers. The need to learn from past experience has been stressed as a means to minimize recurrence of similar problems in future programs in the Eastern Region.

In an attempt to draw some lessons for Phase II, major findings of the MSU micro-economic and regional planning study results were briefly reviewed. For instance, the EORD is characterized by its low levels of production and monetization, high variability in rainfall patterns and soil fertility, lack of spatial association between population pressure and physical resource potential, etc. Subsequently, some lessons to be learned from the 1974-1981 EORD/IRDP Phase I experience have been outlined:

- That EORD/IRDP does not possess viable technical themes suitable to the diverse agroclimatic conditions characterizing the region.
- That the EORD not only lacks the capacity to motivate and manage its personnel, but is also unable to effectively deliver support services for even its more focused agricultural development programs.
- That instituting a management information system can contribute to the success of a project, particularly if systematically used for assessing not only routine implementation tasks but also farm technology, as well as the flow of expected benefits to the target population or area.
- That uncoordinated multidonor intervention not only aggravates the management problem for the host country agency, but can adversely affect overall project results if individual donors fail to implement planned intervention.

Other specific lessons and subsequent policy implications emanating from the performance of the individual components of the IRDP, such as the agricultural credit and product marketing activities, have also been presented.

The Phase II EORD program consists of two projects: the overall IFAD-led project (with less early USAID planned contribution) and the USAID/EORD Food Production Management

Assistance Project. Both projects are to be implemented during the 1982-1987 period.

The overall IFAD-led project, having the same goal as the Phase I project, intends to expand the capacity of the EORD and to increase food production, food security, and income of the rural people in the four sectors of the Eastern ORD. The project anticipates a \$27.7 million contribution from four participants: IFAD, CCCE, UNDP, and the government of Upper Volta. The funds from IFAD and CCCE are largely loans, while those of UNDP are on a grant basis. The \$14.5 million contribution from IFAD, for instance, is given as a loan for 50 years, with a 1 percent service charge per year excluding a grace period of 10 years. The project is expected to reach 8,000 farm families in the project area. Anticipated physical results of the project include: increased annual crop production of approximately 12.5 percent, 208 kilometers of roads, 30 cereal banks, 60 grain mills, a training unit, etc. The typical farming household which adopts animal traction and other recommended innovations is expected to have a cash income of \$675 by the end of the project. The estimated overall internal rate of return for the project is about 20 percent, and the export of project-produced agricultural products would generate an annual foreign exchange of \$3.2 million.

The second project, the USAID/EORD Food Production Management Assistance Project, resulted because the IFAD-led project paper was found inadequate to fulfill the requirements

of an AID project paper. When the IFAD representatives refused to engage in further analysis, AID representatives decided to define a discrete project. Its three major components are high-level training, special studies, and technical assistance for evaluation, costing \$3 million during the life of the project.

In assessing the IFAD-led project paper, it is observed that the designers have failed to incorporate significant lessons learned from the 1974-1981 experience. For example, the IFAD proposal assumes that a package of improved practices exists for the region, contrary to the reality reflected by the various indicators of the 1974-1981 experience. The crop yield figures used in the IFAD project paper, perhaps pulled from experiment station trial reports, are highly optimistic when compared to the 1978-1979 farm level data. Aside from the unrealistic expectations embedded in the revenue figures, the return calculation also overlooks the fact that there is a large initial investment cost and deferred benefit associated with the adoption of the existing animal traction package. As a 10-year investment analysis shows, the first four years of the investment period for oxen traction and the first two years for donkey traction are represented by deficit incremental net benefits. In both instances, higher levels of positive incremental net benefits are generated late in the investment period.

The expected export tax revenue to accrue to the central government amounts to about \$250,000 per year. But

the annual recurrent cost requirement of the project goes as far as \$1,000,000 per year towards the end of the project. In the short run, 25 percent of the salaries of central ORD staff and some operating expenditures are to be picked up by the donors.

## 2. Recommendations

Some recommendations resulting from the implications of the 1974-1981 IDRP experience include the following:

- a. The major thrust of the Phase II EORD food production program should be to generate a viable technical package suitable to the various agroclimatic zones found in the region. The focus of the research would be to test and develop new varieties, forage crops, improved tillage practices, crop storage, soil erosion control, soil fertility improvement, fertilizer, and insecticides. Accomplishing this task requires a multidisciplinary team (economists, agronomists, etc.) supported by adequate funding. The team's activity should also include a continuous assessment of project activities to gauge its progress: the project's adherence to its work programs, extent of target fulfillment, resource utilization, etc. Integrating the proposed evaluation unit into the ORD structure not only saves additional expenditure on new office construction, but facilitates the institution-building process through counterpart training.

- b. Maintaining a motivated and trained extension team and other personnel is essential to the success of the Phase II project. It is therefore important to:
- reward the extension personnel systematically
  - implement the proposed training activity carefully
  - develop a well-thought-out formal and inservice training program for both farmers and agents
  - promote research and extension linkages.
- c. Given the generation of viable packages, additional provisions to improve the low level of loan repayment rates include the following conditions:
- Inputs should be delivered on time.
  - Farmers should be informed ahead of time when credit agents will be collecting repayment, so that they are not taken by surprise and will have no excuse to evade repayment.
  - Credit agents should not be removed or reassigned to other areas before the end of the loan collection period, because new agents will not be known to the farmers.
  - Revise the terms of repayment of medium-term loans to allow for longer periods of repayment. Given that the medium-term credit program is very costly relative to farmers' incomes, a longer period of repayment with smaller installments should be less of a burden. Furthermore, there is a slow learning curve for farmers who are using donkeys or oxen for

the first time; it takes about three to four years before a farmer knows how to competently use a complete package of donkey and/or oxen traction equipment.

- Stricter repayment enforcement measures should be taken against farmers who are delinquent in repaying their loans. For instance, local government should cooperate in taking defaulters to court.
  - Based on the on-farm studies, develop--and encourage farmers to produce--profitable cash crops or other enterprises to generate cash for production costs.
  - Develop a budget that reflects the loan repayment capacity of households.
  - Tougher measures, including firing and/or court action, should be taken against credit agents guilty of embezzlement; but an incentive system should be established to reward good credit agents.
- d. Given the considerable amount of external technical and financial assistance supporting the EORD food production Phase II project, at least two provisions are essential to ensure its eventual success:
- Design a gradual decline of assistance, rather than abrupt withdrawal.
  - Draw clear specifications of duty for the participant donors so that respective donors can discharge their roles in a timely manner.



- e. Some priority areas for future research are:
- investigation of the possibilities and necessary arrangements for mobilizing saving in rural areas
  - development of cost and return figures on the most promising rural small-scale enterprises
  - an EORD road system study prioritizing strategy for improvement of the road network.

## APPENDICES

APPENDIX 1

LOGICAL FRAMEWORK

EORD, UPPER VOLTA, ORIGINAL

# APPENDIX 1

## LOGICAL FRAMEWORK

### EASTERN ORD - UPPER VOLTA

(original, dated 7/30/74)

GOAL STATEMENT	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
1. To assist in the overall development of the rural sector in Upper Volta by supporting the GOUV ORD program	<ol style="list-style-type: none"> <li>1. Increase in overall agricultural and livestock production on the national level</li> <li>2. Established rural health and education services</li> <li>3. Measurable increases nationally in rural per capita income</li> </ol>	<ol style="list-style-type: none"> <li>1. National statistics</li> </ol>	<ol style="list-style-type: none"> <li>1. GOUV will continue to support the ORD to the best of its budgetary capacity</li> </ol>

PURPOSE	END OF PROJECT STATUS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
1. To upgrade the quality of rural life in the Fada ORD primarily by progressively increasing food supplies and surpluses which can be marketed outside the ORD, 2. climatic vagaries notwithstanding	1. Measurable increases in yields of millet, sorghum, rice and peanuts in areas reached by "encadrement"	1. Crop yields	1. The ORD grain, peanuts purchasing program will be of sufficient size to maintain a better price for the producer but not so high a price as to drive out merchants
	2. Increased marketing of surpluses at higher average seasonal price	2. Local prices	2. Fada ORD will not suffer from population pressure in foreseeable future. Land will not be a limiting factor
3. Revolving BND credit in ORD will be self-financing		3. Ministry statistics, BND records	3. Water resources development and management will help alleviate water shortages
4. Increased livestock production. Disposable surplus up from approximately 11% to 19%		4. Livestock statistics	4. ORD and OFNACER will cooperate in grain price stabilization and marketing efforts
5. Increased per capita disposable income from approximately \$32 per capita to \$264 per year		5. Base line survey, as measured against later	5. OFNACER will provide some funding for the purchase of grain and storage when required

OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
OUTPUTS		
1. Establishment of 4 intensive "encadrement" centers at high possibility locations as determined by soil, access, presence of extension effort, marketing potential, and receptivity to change	1. "Encadrement" of 750-1000 farm families per intensive areas  1. a) Inspection, census information b) Special reports of sub-sector chief	1. Rainfall patterns will return to more nearly normal levels
2. Improved technical, programic, and management capacity of the ORD in general, and particularly at the village level. Alteration of organization to respond to new programs	2. a) Placement of 10 "encadrement" in each intensive center b) Improved communications between Fada and various areas of ORD	2. There will continue to be a ready market for surplus agricultural and livestock production of the Fada ORD
3. Increased food supplies, both from crop and livestock production	c) Installation and staffing of new organization  3. Decreased reliance on external sources of food, both commercial and donated	3. Rural schools will continue to exist as a program. Additional program will be designed to expand numbers of young farmers

OUTPUTS	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
4. Higher levels of marketable surpluses and disposable income among small farmers	4. a) Greater sales of crops and livestock production b) Farmer income levels (in 4 centers average annual income of "encadred" farmer increased approximately eightfold	4. a) Inspection/census b) ORD reports, statistics	4. Increased income will be partly spent to upgrade local diet
5. More extensive acceptance of improved agricultural practices especially in intensive saturation villages	5. Number of farmers using animal traction, collecting fertilizer, using new seed, cultivating vegetables, raising improved breeds of animals, etc. (750-1000 farm families per center)	5. ORD reports	5. Work animals with machine will double area that can be farmed by a small family (2-3 workers)
6. Significant increase in use of low-lying fertile areas ("basfonds") through use of improved water control techniques and use of existing dam storage for small irrigation	6. Approximately 940 hectares of "bas fond" land under cultivation a) Successful demonstration of double cropping potential in "Bas Fonds"	6. ORD reports	6. Plowing with oxen (or donkeys) increases yields by: a) Improving soil/water relations b) use of manure

OUTPUTS	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
7. Greater consistency of supply of well water through well rehabilitation and construction of new hand drawn wells	7. Completion of 120 new and reconstructed wells	7. ORD reports	7. Fertilizer at current world prices is not profitable with existing crop varieties and commodity prices
8. More active entrance into rural life or farming by graduates of rural schools	8. a) Increase in percentage of graduates of rural schools who enter agriculture b) Use of credit and other incentives offered in intensive centers	8. a) Rural school statistics	3. Use of fertilizer at prices subsidized by the cotton program would be profitable if a supply is available for the ORD. (The ORD currently provides no cotton for the international market)
9. Improved village access in farm-to-market roads	9. a) Increase in number and kms of improved roads b) Road repair brigade established under ORD c) Number of merchants from outside (trucks)	9. a) ORD reports b) ORD road team statistics c) ORD reports	9. Byproducts from agriculture processing, especially low grade cotton seed, will be available at a low price for animal feeding



OUTPUTS	OBJECTIVELY		IMPORTANT ASSUMPTIONS	
	VERIFIABLE INDICATORS	MEANS OF VERIFICATION		
10. The population of the ORD will begin to improve their diets	10. a) Voltaic home agents trained and in each center b) Acceptance of vegetable production/consumption, greater protein intake	10. a) ORD manpower report b) Nutritional survey	10.	Agreements can be reached with the nomadic
11. Greater role and participation for women in the productive programs in the village	11. a) Number of women attending agricultural school b) Number of women attending agricultural meetings (1000 women/center)	11. a) ORD reports b) Reports of sub-sector chief c) Reports of PC volunteers	11.	The ORD can intervene in the marketing of peanuts, sesame, sheanuts and cotton with benefits to producers and with income generated for ORD operation
12. Improved range management in selected locations around intensive zones	12. a) Number of pastures put into reserves b) Agreement between farmers and herders on pasture use	12. a) ORD reports b) Reports of sub-sector chief c) Reports of PC volunteers	12.	Seed multiplication center financed by a separate AID project and under the central direction of DSA, will be established in the Eastern ORD

OUTPUTS	OBJECTIVELY		MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
	VERIFIABLE INDICATORS			
13. Substantial increase in the number of trained "encadreurs" for Fada ORD	13. a) 25 new "encadreurs" trained for ORD each year. Ratio of "encadreurs" to "encadreurs" in intensive areas is expected to be 1/100	13. a) ORD reports	13. IRAT will be able to provide localized adaptive varietal testing in the ORD	
a) Completion of new dormitory at Matourkou for students	b) Overall increase in number of "encadreurs" from 18 to 113	b) Reports from Matourkou Training Center		
14. Increase farmer income through suppression of fraudulent oversized "tines" used by merchants to cheat farmers (standard measure is a 20-liter container called a "tine")	14. Manufacture and distribution throughout the ORD of 600 standard "tines." Increased farmer return of 16-20% on grain that is commercialized	14. a) ORD reports  b) Special survey	14. The Africa Development Bank will study the upgrading of selected agricultural secondary roads in the ORD	
15. Reduced storage loss through better and wider use of "gamma-grain" (insecticide)	15. Reduced storage loss from 20% to 10%	15. ORD reports		

OUTPUTS	OBJECTIVELY VERIFIABLE INDICATORS		MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
16. Increased resources available to the ORD through the purchase, transport and sale of peanuts and other cash crops	16.	Increased ORD financing of operations through returns earned by ORD on peanut and other crop transactions	16. a) ORD reports b) ORD budget	
17. Increased communication facilities within the ORD	17.	Radio communication stations in 14 sub-sectors, the ORD, the hospital and in any of the intensive centers which are not already sub-sectors	17. ORD reports	
18. Improvement in the level of technical management through retraining agricultural agents	18.	Number of courses, seminars training programs offered	18. ORD reports	
19. Greater mobility of "encadreur," livestock vets and home agents in ORD	19.	Provision of each "encadreur," livestock vet, and home agent with a mobylette	19. ORD reports	

OUTPUTS	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
20. Greater transport resources of ORD, allowing greater distribution of inputs and purchase of produce	20. Number and type of trucks provided by program: 1 7-ton truck, 6 3-ton trucks, 6 small pickups	20. ORD reports	
21. Community development in each of 4 intensive centers through self-help efforts	21. 4 schools/village meeting places constructed, 2 dispensaries constructed, 120 wells constructed, 20 village associations organized	21. ORD reports	
22. Creation of demonstration farms in each of the 4 intensive centers	22. Variety tests, livestock, tree nursery, "bas fonds" etc.	22. ORD reports	
23. Completion of farm machinery workshops to make and repair farm equipment	23. One workshop equipped and operating in each of 3 Circles (Fada, Diapaga, Bogande)	23. ORD reports	
24. Introduction of improved livestock breeds and practices	24. Trained encadreurs a) In livestock, and speaking Peuhl and Gourmanche	24. ORD reports	

APPENDIX 2

LOGICAL FRAMEWORK

EORD, UPPER VOLTA, REVISED

## APPENDIX 2

### LOGICAL FRAMEWORK

#### EORD, UPPER VOLTA, REVISED \*

<u>Details and Quantities</u>		<u>Key Assumptions</u>
<u>Goal</u>		<u>For Purpose Achievement to Lead and Goal Achievement</u>
Increased production, income and quality of life for rural population in Fada ORD		<p>1. Improved technical packages adapted to the Eastern ORD can be developed.</p> <p>2. The GOUV will have the means and desire to provide necessary supporting services.</p> <p>3. Constraints to regional development that are national in nature will be effectively addresses by the GOUV.</p>
<u>Purpose</u>	<u>End of Project Status</u>	<u>For Output Achievements to Lead to Purpose Achievement</u>
<p>Increase GOUV's capacity to assist small farmers in the Fada ORD to increase their agricultural production and incomes; and begin increasing production in the intensive zones.</p> <p>* This logical framework is for the purpose of this evaluation. It is meant to</p>	<p>1. Necessary supporting services being provided to 10-15,000 farms.</p> <p>2. Firm data base for planning and evaluation:</p>	<p>1. a) The ORD has the managerial and technical capacity to deliver the necessary inputs and services.</p> <p>b) Inputs and activities not financed by AID will be forthcoming from other donors or the GOUV.</p> <p>2. a) Sampling techniques used in surveys are valid and variables are such that they can be reliably measured</p>

Details and Quantities	Key Assumptions
<p>describe the project as presently designed. Changes in this logical framework may be required depending on the outcome of some of the actions recommended by the evaluation team.</p>	<p>over a two to three year period.</p> <p>b) There are no obstacles to providing farmers with the necessary equipment and extension follow-up and the ORD is able to devise and implement an effective means of monitoring the experience of farmers and impact on production.</p>
<ul style="list-style-type: none"> <li>- natural resources</li> <li>- technical packages</li> <li>- farming systems</li> <li>- experience with animal traction</li> <li>- marketing</li> <li>- credit systems</li> </ul>	<p>3. The ORD is willing to utilize the work of the MSU and FAO experts as the basis for its regional development plan.</p>
<p>3. Regional plan for medium term</p>	<p>4. a) same as 1) above.</p>
<p>4. Fifty percent increased production in the intensive zones.</p>	<p>b) The technical package being introduced is more productive than existing systems and is acceptable to farmers.</p>
<p>5. Non-formal education program established and reaching ___ individuals.</p>	

#### Outputs

1. Expand the capacity of the ORD for administration and outreach

	Details and Quantities	Key Assumptions
a. Central and field facilities	<p>a. 1) Headquarters</p> <p>2) Matourkou training center</p> <p>3) Power and water facilities</p> <p>4) 3 storage warehouses</p> <p>5) 3 houses for contractors</p> <p>6) Vehicles and equipment</p> <p>7) Budget support</p>	
b. Training	<p>b. 1) _____ staff sent for long-term training abroad</p> <p>2) _____ staff sent for short-term training</p> <p>3) _____ in-country training spent</p> <p>c. 1) _____ % of MSU team time spent on operational functions within ORD</p> <p>2) short-term consultants</p>	<p>Trainees can be identified and freed from their work</p> <p>The ORD management is willing to allocate part of the MSU team's time to operational rather than research activities.</p>
c. Technical assistance		
2. Research and planning	<p>2. a) 2 years data for traditional and some improved farm systems</p>	<p>- MSU researchers arrive on time and scope of data to be collected proves</p>



Details and Quantities	Key Assumptions
<p>including: costs and value of production, value marketed, labor use, cropping patterns and household consumption.</p> <p>b) Supply and demand for short and med term credit and possible mechanisms.</p> <p>c) Possibilities for animal traction and animal production add-ons to existing farming systems.</p> <p>d) Amounts of marketed surpluses, constraints, price fluctuations.</p>	<p>to be manageable and not over-ambitious.</p> <p>- counterparts and interviewers are available to assist the MSU researchers.</p> <p>- data availability is such that meaningful findings can be obtained by early 1980.</p>
<p>3. Production and marketing interventions at the farm level</p>	<p>3. a) _____ loans for animals and equipment in the intensive zones</p> <p>b) _____ loans for equipment outside the intensive zones</p> <p>c) _____ uses of demonstration funds to village groups</p> <p>d) 3,000 to 4,000 farms exposed to intensified extension services (1 agent/75-100 farmers)</p>

## APPENDIX 3

### Input and output indicators

# APPENDIX 3

## Input and output indicators

Type	Elements to be monitored	Data collection methods	Data analysis
Inputs	staff <ul style="list-style-type: none"> <li>- arrival date</li> <li>- work plan</li> <li>- cost</li> </ul>	records staff meetings records	recording network analysis accounting
	equipment <ul style="list-style-type: none"> <li>- arrival date</li> <li>- quality</li> <li>- cost</li> <li>- stocks held</li> <li>- maintenance</li> </ul>	records technical check accounts book-keeping "	network analysis recording accounting stock management.
	agric. Inputs <ul style="list-style-type: none"> <li>- arrival date</li> <li>- quality</li> <li>- cost</li> <li>- stocks held</li> </ul>	ibid	ibid
	recurrent Budget <ul style="list-style-type: none"> <li>- receipts</li> <li>- expenses</li> </ul>	accounts accounts	accounting + audit "
	credit facilities obtained	records	recording
	activities achieved %	internal reports	aggregation and network analysis
Activities operation	activities quality <ul style="list-style-type: none"> <li>- infrastructure</li> <li>- services</li> </ul>	technical checks beneficiaries inter-views	comparison with standards
	activities cost	cost-accounting	cost-accounting
	infrastructure construction	internal reports	aggregation and comparison with plan
Achievements (in % of objective and in physical terms)	distribution of fertilizer, pesticides, seeds, etc.	book-keeping	"
	agricultural services provided (by type and type of farm)	book-keeping	
	loans allocated	book-keeping	

## APPENDIX 4

### Performance and impact indicators

# APPENDIX 4

## Performance and impact indicators

Type	Elements to be monitored	Data collection methods	Data analysis
Agricultural production system	rotation	survey and/or aerial photography	statistical analysis
	input use	surveys disbursing book	"
	farm equipment	survey	"
	labour and work calendar	calculation based on standard coefficients	"
	production practices	extension workers reports, surveys and observations on selected plots	"
	agricultural production	surveys, and crop-cutting experiments, harvest records	"
	marketing of farm products	surveys records	"
Farmers and agrarian structure	farm income	surveys and farm budget calculations	"
	household income	surveys	"
	consumption	household surveys and shops data	"
	nutrition	measurement, calculation based on standard coefficient	"
	assets	surveys (interviews or direct count)	"
	health status	officials records and surveys	"
	farmers attitude towards innovation	"	statistical analysis
	farmers associations	"	sociological study statistical analysis
	land tenure, etc.	"	"
	social structure	"	sociological study

Type	Elements to be monitored	Data collection methods	Data analysis
Ecology	soil fertility	sample	laboratory test
	erosion	punctual measurement	cartography
		aerial photography	statistical analysis
	hydrological balance	punctual measurement	statistical analysis
	ecological systems	bibliography and measurements	simulations and statistical analysis
Economic environment	effects on agro-industry	survey and registered data	accounts study
	effects on state budget	registered data	"
	effects on balance of trade and balance of payment	"	"
		"	"
	effects on other agents	"	"
	effects on population	census and surveys	statistical analysis

## APPENDIX 5

### Final List of Questionnaires

## APPENDIX 5

### Final List of Questionnaires

#### Used in the EORD/IRDP, 1978-79 Farm Survey

<u>N° de FICHE</u>	<u>TITRE</u>
1	Semences, fumures, et produits phytosanitaires utilisés
2	Récoltes des champs
3	Recoltes des carres de rendement
4	Temps de travail perdu du à des indispositions des membres du ménage
5	Achats et réparations des facteurs de production
6	Ventes des produits cueillis par le ménage
7	Achats des semences et produits agricoles
8	Ventes des produits agricoles produits par le ménage
9	Commerce des produits agricoles
10	Achats d'animaux
11	Ventes d'animaux et produits animaux
12	Dépenses pour l'élevage
13	Alimentation des animaux
14	Gardiénage et maladies des animaux de trait
15	Coûts et revenus provenant d'occupations non-agricoles
16	Prêts en espèces
17	Prêts en nature
18	Remboursements reçus
19	Emprunts en espèces
20	Emprunts en nature
21	Remboursements effectués
22	Cadeaux donnés
23	Cadeaux reçus
24	Paiements recus pour les ventes à crédit
25	Paiements effectués pour les achats à crédit
26	Transformation des produits agricoles: achats et ventes
27	Précisions sur les dépenses pour les animaux de trait
40	Temps de travail de chaque membre du ménage sur le champ: _____
41	Temps de travail au champ par des personnes extérieures aux ménages
42	Traction animale: utilisation des attelages dans les champs
43	Traction animale: transport par charrette
44	Temps de travail des membres du ménage dans les champs d'autrui
45	Temps de travail des membres du ménage dans toutes les activités d'hier
46	Temps du travail en élevage de chaque membre du ménage
50	Recensement initial des membres du ménage
51	Recensement initial des champs du ménage
52	Historique des champs
53	Inventaire du cheptel mort et matériel agricole
54	Valeur du cheptel mort et du matériel agricole
55	Inventaire du cheptel vif



## List of Questionnaires Used (con't)

<u>N° de FICHE</u>	<u>TITRE</u>
56	Changement démographique dans les ménages
57	Stockage des récoltes
58	Mesurage des superficies des champs, cultures présentes, et carrés de densité
59	Recensement des vendeurs et services aux marchés locaux
60	Recensement des occupations non agricoles
61	Récapitulatif des champs
62	Changement dans la taille des troupeaux (achats et ventes exclus) et les impacts des maladies
63A	Situation des prêts en fin d'année
63B	Situation des emprunts en fin d'année
64	Historique des animaux de trait
65	Récapitulatif des infirmes
66	Précision sur la productivité des différentes catégories de travailleurs
67	Prix aux marchés locaux
68	Revenus reçus au cours de l'année écoulée
69	Problèmes spécifiques des cultures
70	Stock de matériel et équipement utilisés dans les activités non agricoles
71	Ration Alimentaire du ménage
72	Historique de l'utilisation de la traction animale
73	Achats de biens de consommation
74	Coûts des invitations de cultures
75	Institutions traditionnelles d'épargne et attitudes envers l'épargne et le crédit
76	Système formel de crédit et coûts implicites
77	Contact avec l'ORD
80	Listes des ménages recensement 1975
81	Superficies des champs
83	Valeur de cheptel vif
85	Codes des secteurs et villages
87	Prix trimestriels des produits agricoles
88	Prix de vente de sorgho/mil
89	Évaluation de la qualité des données par les enquêteurs
100	Tirage de l'échantillon
102	Renseignement sur les animaux de trait
104	Poids des unités de mesure utilisées sur les fiches 02 et 13
105	Inventaire de l'équipement traction animale
106	Mesurage des animaux de trait
107	Poids des louches et Calebasses
108	Comparaison de la campagne 1978 aux campagnes précédentes
109	Renseignements supplémentaires sur les champs
110	Parcage aux champs
111	Dégâts aux champs
113	Questionnaire supplémentaire sur la traction animale
114	Vérification des données des récoltes, des ventes, et des stocks

## List of Questionnaires Used (con't)

<u>N° de</u> <u>FICHE</u>	<u>TITRE</u>
115	Système formel de crédit et coûts implicites
116	Essais du Phosphate Naturel et Labour attelé
117	Pertes en stockage
158	Coordonnées rectilignes
161	Récapitulatif des champs pour utilisation avec fiche 58
204	Fiche de dépouillement (données au niveau des ménages)
205	Fiche de dépouillement (donnés au niveau des villages)

APPENDIX 6  
EASTERN ORD INTEGRATED RURAL DEVELOPMENT  
PROJECT BUDGET

APPENDIX 6

EASTERN ORD INTEGRATED RURAL DEVELOPMENT

PROJECT BUDGET

(\$ Thousand)

<u>Total</u>	<u>3,564</u>
<u>AID Contribution to date</u>	<u>3,063</u>
1. <u>US Personnel</u>	<u>911.9</u>
1 project Manager	
Institutional contract, 8 man-years	
Mktg. & Transport Econ., Credit &	
Coops Spec., An. Hus./Range Mgmt.	
Spec. plus consultants	710.9
2. <u>Commodities &amp; Equipment</u>	<u>560.2</u>
a. <u>ORD Central Equipment</u>	<u>(457.4)</u>
- 15 Vehicles: 9 pick-ups, 2 station-	
wagons for ORD, 3 pick-ups and 1	
station-wagon for contract team	89.2
- 1 7-8 T Truck	13.0
- 6 3-5 T Truck	78.0
- 225 mobylettes for agents, animatrices,	
interviewers, livestock agents, admin.	
personnel, sub-sector and sector chiefs	70.0
- Central repair shop tools and equipment	20.0
- Farm equipment workshop and tools and equipment	15.0
- Generator(s) totaling 100 KVA	30.0
- Radio communications network	73.0
- Office equipment & furnishings; ORD	
sector and sub-sector	53.2
- 2 trailers	8.0
- Technical equipment and supplies	8.0

b.	<u>Marketing</u> (includes use of ORD Central Equipment as well)	(29.6)
	- 600 grain measures	4.6
	- Marketing equipment and supplies	20.0
	- Rice decorticator	5.0
c.	<u>Rural Engineering</u> (includes use of ORD Central Equipment as well)	(30.6)
	- 8 brick making presses	3.2
	- 1 tractor 75 hp. disc plow and attachments	27.4
d.	<u>Animal Husbandry/Range Management</u> (includes use of ORD Central Equipment as well)	(17.6)
	- 8 refrigerators	3.1
	- 3 freezers	3.0
	- 1 ice-maker	6.5
	- Veterinary equipment and supplies	5.0
e.	<u>Demonstrations &amp; Training</u>	(25.0)
	- 5 sets of equipment, tools, fertilizer, seed, breeding stock, etc.	25.0
3.	<u>Other Costs</u>	<u>1,590.9</u>
a.	<u>Training</u>	(134.0)
	participant Training; details provided in individual PIO/P's	92.0
	In-country training; in operating budget support	42.0
b.	<u>Construction</u>	(404.1)
	Encadreur Center, Matourkou	35.5
	ORD Admin. Complex	230.0
	3-Village/Sector storage facilities	28.6
	AID Contractor Houses	110.0

c.	<u>Research</u>	(51.3)
	Contracts, two Voltaic research organizations	
	Group organization and ag credit	19.7
	Sedentarist-nomad eco-social relationships	31.6
d.	<u>Special Funds</u>	(350.0)
	Operating Budget Support	350.0
	<u>Revolving Funds</u>	<u>651.5</u>
	Medium Term rural Credit	466.5
	Marketing Fund; cash crops, etc.	185.0
	<u>GOUV Contribution</u>	<u>501.0</u>
1.	Personnel	384.0
2.	Operating budget, excl. personnel	117.0

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