

TOGO ANIMAL TRACTION DEVELOPMENT PROJECT

A.I.D. No. 693-0218

Final Evaluation Report

July-August 1988

Prepared by: Development Alternatives, Inc.
Washington, D.C.

FOR: The Office of the A.I.D. Representative
Lomé, Togo

TOGO ANIMAL TRACTION DEVELOPMENT PROJECT

A.I.D. No. 693-0218

Final Evaluation Report

July-August 1988

Prepared by: Development Alternatives, Inc.
Washington, D.C.

Thomas Zalla
Nicolas Kulibaba
Peter Watson

FOR: The Office of the A.I.D. Representative

Lomé, Togo

TOGO ANIMAL TRACTION DEVELOPMENT PROJECT

A.I.D. NO. 693-0218

FINAL EVALUATION REPORT

Table of Contents

Abbreviations and Acronyms	i-ii
Map of Togo	iii
Preface	iv-v
1.0 Executive Summary	1-7
2.0 Introduction	8
3.0 Methodology	8-9
4.0 Project Achievements and Outputs	10-12
5.0 Changes in the Policy and Institutional Framework During Project Implementation	13
6.0 Animal Traction Project (PCA)	14
6.1 Resource Management	14
6.2 Training	15-16
6.3 Delivery Systems	17-20
6.4 Credit Program	21-23
6.5 Adaptive Research	23-26
6.6 Animal Supply	26-27
6.7 Animal Health	27-30
6.8 Participant Training	30-31
7.0 PROPTA	32
7.1 Information Services	32-33
7.2 Resource Management	33-34
7.3 Training	34-35
7.4 Coordination of Credit Programs	36-37
7.5 Input Supply	37-38
7.6 Equipment Research and Development	38-39
7.7 Animal Supply	39-42
7.8 Animal Health	42-45
7.9 Monitoring and Evaluation	45-46
8.0 Economic Analysis	47-49
9.0 Impact of USAID Withdrawal	50-54
10.0 Restructuring PROPTA	55-56
11.0 Conclusions and Recommendations	57-62

Annexes

- A - Animal Traction Training Program
- B - Performance of PCA's Credit Program
- C - Draft Animals Trained by PCA
- D - Farmers and Extension Agents Trained by PCA
- E - Growth of Oxen Traction in Togo
- F - Cost of Raising Steers at Namiele for One Year
- G - Economic Analysis
- H - Equipment and Technical Problems
- I - Persons Contacted
- J - Bibliography
- K - Evaluation Scope of Work

ABBREVIATIONS AND ACRONYMS

AID	Agency for International Development
AIP	Accelerated Impact Program
BI	Budget d'Investissement (National Investment Budget)
CAT	Centre d'Appui Technique (Technical Support Center)
CFA	West and Central African Franc
CNCA	Caisse Nationale de Crédit Agricole (National Agricultural Bank)
COCA	Comité d'Etude et d'Orientation du Programme de la Culture Attelée (Animal Traction Study/Orientation Committee)
CREAT	Centre de Recherche d'Elevage d'Aventenou au Togo (Livestock Research Center)
CRED	Center for Research and Economic Development
DAC	Development Assistance Corporation
DRDR	Direction Régionale de Développement Rural (Regional Rural Development Offices)
FAC	Fonds d'Aide et de Coopération (French Assistance Agency)
FAO	Food and Agricultural Organization
FED	Fonds Européen de Développement (European Development Fund)
FIDA	Fonds International de Développement Agricole (International Fund for Agricultural Development)
FSSP	Farming Systems Support Project, University of Florida
GOT	Government of Togo
GTZ	Federal Republic of Germany Development Assistance Program
IBRD	International Bank for Reconstruction and Development (World Bank)
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IITA	International Institute for Tropical Agriculture (Ibadan, Nigeria)
INADES	Institute African d'Etudes Economiques et Sociales (African Institute for Economic and Social Studies)
INFA	Institut National de Formation Agricole (National Agricultural Training School)
IQC	Indefinite Quantity Contract
IRAT	Institut de Recherche Agronomique Tropicale (Tropical Agricultural Research Institute)
M/E	Monitoring and Evaluatuion
MDR	Ministère de Développement Rural (Ministry of Rural Development)
PACD	Project Activity Completion Date
PC	Peace Corps
PCA	Projet Culture Attelée (Animal Traction Project)
PCV	Peace Corps Volunteer
PID	Project Implementation Document
PIL	Project Implementation Letter
PIR	Project Implementation Review
PP	Project Paper

PPC/CDIE	Program and Policy Coordination/Center for Development Information and Evaluation (A.I.D.)
PROPTA	Projet de la Promotion de la Traction Animale (Animal Traction Promotion Project)
PSC	Personal Services Contractor
REDSO/WCA	Regional Economic Development Service Office/West and Central Africa
SAFGRAD	Semi-Arid Food Grain Research and Development
SOTOCO	Société Togolaise du Coton (Togolese Cotton Company)
T&V	Training and Visit (Agricultural Extension System)
TA	Technical Assistance
TAT	Togo Animal Traction Project
UPROMA	Unité de Production de Matériel Agricole (Factory for Producing Agricultural Materials)
UN	United Nations
USAID	United States Agency for International Development (Togo Program)
VITA	Volunteers in Technical Assistance

Preface

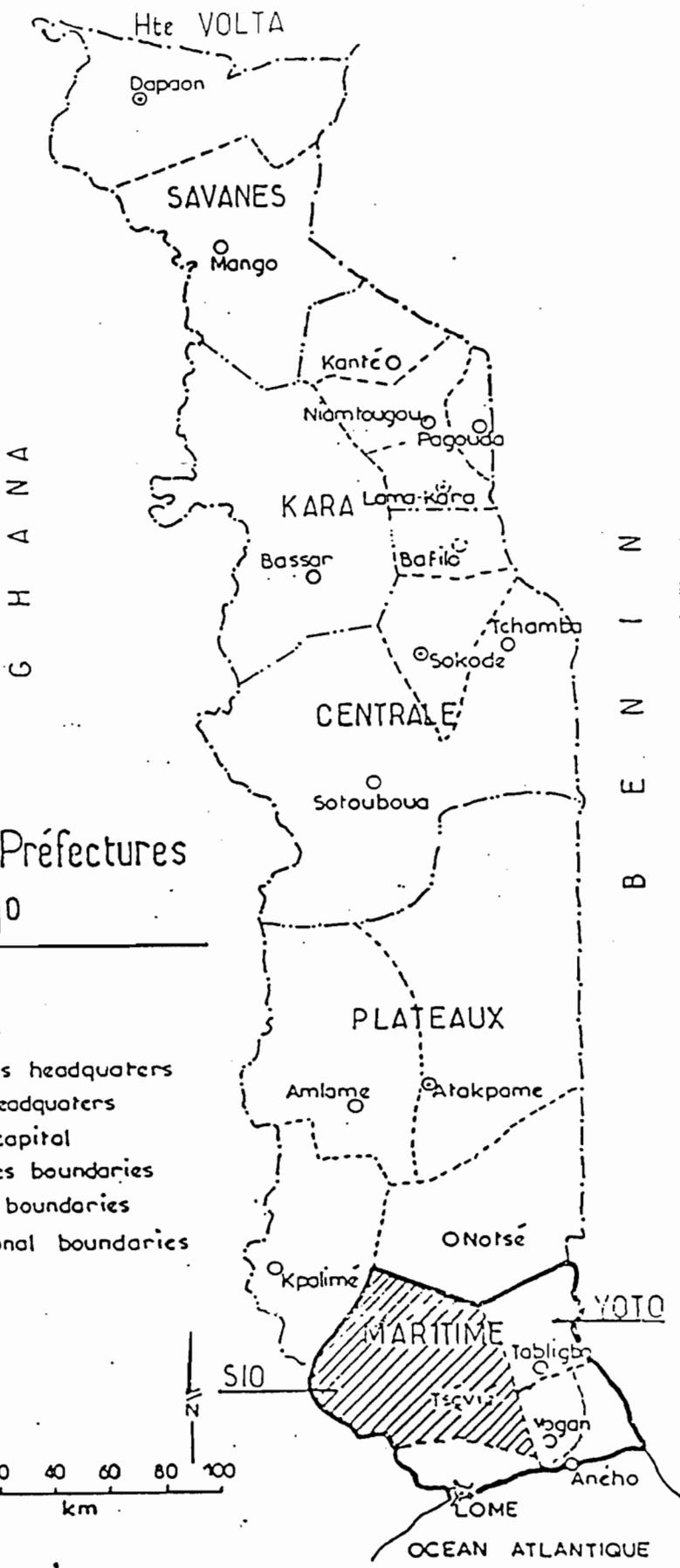
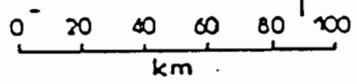
The field work for this evaluation report was carried out in Togo during the June 8-25, 1988 period. The initial English draft of this report was completed on July 8 and distributed to the Project Technical Assistance Team members and other interested parties for review shortly thereafter. At the same time, a French translation of the Executive Summary and Conclusions and Recommendations of the report was provided to the Togolese officials responsible for the execution of the Project since it began in late 1983. The Technical Assistance (TA) Team made a thorough review of the draft report and in late July provided the Office of the AID Representative (OAR) with 32 pages of written comments and some 40 pages of supporting materials. In August, the Togolese project officials provided the OAR with over 20 pages of written comments. Following the receipt of all these comments, an in-depth review meeting of all issues was held in the OAR office on August 16, 1988. This was followed by individual meetings between the OAR and TA team members and Togolese project officials. Also, comments from OAR's accounting station (WAAC/Abidjan) were solicited and received on August 8 on the local currency management questions raised in the draft report. This process of review, consultation and collection of additional information was completed on August 29 with the receipt of the TA team's 100-page final report. This was the same date that the four-person TA team departed Togo after four years of service. The TA contract ended on August 31, 1988.

With the results of this process in hand, OAR proceeded to drafting the final version of this report as presented in the following pages. This final version represents, therefore, the best possible coverage of Project accomplishments, or lack thereof, and the problems associated with the implementation of such a complex undertaking. Although the OAR believes that many of the lessons learned through the implementation of this Project should be studied by those attempting a similar activity in other countries, it should be noted that Togo's favorable environment and actual agricultural development stage were, in the OAR's opinion, major contributing factors to what the evaluators termed the "unqualified success" of this Project.

It can logically be concluded that such a success had an important positive impact on the economic and social well-being of Project beneficiaries and on Togo's general developmental progress. This conclusion is based primarily on the nine hundred Togolese farmers who began using animal traction as a direct result of the Project and the over 7,000 animal traction farmers who now have access to extension services that have

Map 1:
Regions and Préfectures
of Togo

- prefectures headquarters
- ⊙ regional headquarters
- ★ national capital
- - - - - préfectures boundaries
- · - · - regional boundaries
- · - - - international boundaries



been strengthened and expanded by the Project. Furthermore, as the evaluation indicates that animal traction produces a net income 39% higher per hectare than manual cultivation, and a farmer increases surface area farmed by 30% on the average when animal traction is used, it must be concluded that the Project had a significant impact on economic growth. These are results that A.I.D. can be very proud about.

Mark G. Wentling
A.I.D. Representative/Togo-Benin
September 2, 1988
Lomé, Togo

1.0 EXECUTIVE SUMMARY

1.1 Project Title and Number: Togo Animal Traction Development
693-0218

1.2 Development Problem and Project Description

Following a period of unsuccessful attempts to introduce tractors as a means of promoting agricultural production, the government of Togo reassessed its strategy, stressing animal traction as a technology appropriate to the development of existing production systems.

The project was intended to assist the GOT in improving, coordinating and expanding on its activities in support of the promotion of animal traction among the small holders farmers in Togo. AID funding financed the services of a U.S. technical assistance team to assist the principal GOT implementing agencies (PROPTA and the Directions Regionales du Developpement Rural of Kara and Savanes regions) in their mandate to coordinate and expand animal traction activities in Togo. A.I.D. funding also assisted in the construction of administrative and technical facilities, and in the procurement of essential commodities and vehicles. GOT financing covered local personnel costs as well as those associated with the establishment of a credit revolving fund to assist farmer-adopters to acquire the animals and implements necessary for converting from traditional farming methods to animal traction.

The Project's beneficiaries were smallholder farm families living in the two impact zones.

1.3 Evaluation Purpose and Methodology

This end of project evaluation was intended to assess the impact of the project; to identify successful areas of project design and implementation; and to indicate possible areas of future USAID assistance and intervention.

Standard evaluation methodology was employed, including intensive interviews with GOT officials, USAID and project staff, and recipients. Financial, technical, and administrative records of project activity were also consulted.

1.4 Project Achievements and Outputs

Based on logframe targets and prescribed indicators, the project was an unqualified success. Approximately 700 smallholder farmers benefited directly from the technical package promoted by the project, while more than 1,700 individuals participated in project training activities. Approximately thirty in-country projects have begun to utilize the services of implementing institutions supported by USAID. Training programs designed and implemented by the project are sustainable and well-suited to existing institutional requirements.

Facilities constructed by the project included sixteen rural training centers, now equipped, staffed, and functioning, and office facilities for a regional animal traction development unit.

1.5 Policy and Institutional Framework

The project has benefitted from evolving GOT policy which specifically endorses animal traction technology, and which mandates high-impact training and visit extensions systems. These changes enhance the prospects for sustainability of activities and programs begun under the project, and may be viewed as an indicator of viability of animal traction technology.

1.6 Animal Traction Project (Projet Culture Attelee)

1.6.1 Resource Management

The impact of this project was somewhat limited by delays in the provision by USAID and GOT of earmarked funds. These delays were critical in the earliest phase of project implementation.

Overly complex administrative and management procedures in the circuit of USAID/Lome, REDSO, and the GOT were diagnosed and modified in 1986. However, the project experience indicates that further reforms are required to assure the smooth flow of scheduled resources to projects.

1.6.2 Training

This proved to be the area of most significant project success. Nearly 900 new farmers, an equal number of experienced farmers, and several hundred extension agents received training. Training programs were found to be effective, technically competent, and sustainable by host-country institutions.

1.6.3 Delivery Systems

Sixteen Centres d'Appui Technique (CATS) constructed or managed by the project were integral to the project extension strategy. They serve as delivery points for animal traction equipment, training, and input supply. The role of the CATS could be strengthened under a World Bank-funded national extension program. Technical support from the Peace Corps contributed extensively to the success of the CATS.

1.6.4 Credit Program

Credit is a critical component in facilitating the adoption of animal traction technology. The GOT financed credit through the Caisse National du Credit Agricole, with administration provided by the TA team and project staff.

Although there is room for further improvement: overall repayment rates climbed 36% in the first year of the rose to 64% in the second year of the project to a current level of nearly 93% in the Savanes Region. Some problems in the areas of better defining responsibilities for collection and designing improved procedures for account management remain.

It appears that higher repayment rates may be possible, as demonstrated by the national cotton promotion agency, SOTOCO, which has achieved sustained repayment rates of 98% in areas where the project is active.

1.6.5 Adaptive Research

The project has developed and successfully promoted technical packages through selection of fifty "model farmers." The project's promotes systematic equipment use and has successfully overcome the traditional weeding bottleneck in animal traction programs.

1.6.6 Animal Supply

The project initially obtained animals from two sources: direct purchase by experienced GOT animal traction technicians, and PROPTA, the animal traction coordination institution. In the last year of the project, efforts were begun to encourage farmers to obtain livestock from local herders. While the supply of young steers from local herds appears limited, the growth of animal traction is expected to generate a private sector supply response from herders similar to that which occurred during the 1970s in adjacent areas of Benin.

1.6.7 Animal Health

The project has promoted prophylaxis, animal nutrition, and treatment in an environment where veterinary services are limited. Limited resources and inadequate staffing in the GOT animal health service remain problematic.

1.6.8 Participant Training

As a training needs assessment and program for training were not prepared during the early stages of implementation, an inadequate level of participant training took place during the life of the Project.

1.7 PROPTA

1.7.0

PROPTA was created to facilitate and coordinate the promotion of animal traction technology among nearly forty Togolese projects and institutions. USAID funding and technical assistance have played a key role in its operations.

1.7.1 Information Services

Information services have been successfully established under the project. They include publication of a technical quarterly, with circulation of over 1,000; publication of a 150-page technical manual; a technical worksheets. The quality of technical information issued by PROPTA--could, however, be improved.

1.7.2 Resource Management

As in the case of PCA, serious problems existed in the timely disbursement of funds to the project. Administrative complexities, inadequate training of project administrators, and misunderstandings regarding resource availability were all responsible for delays. GOT budgetary austerity resulted in progressive, but not critical, resource shortfalls.

1.7.3 Training

PROPTA and the project have responded to training needs in the Central Region of Togo, and have formulated programs for farmers, extension agents, and blacksmiths. Problems of finding and keeping qualified staff continue to persist.

1.7.4 Coordination of Credit Programs

PROPTA's mandate includes rationalization of the terms under which credit is provided for equipment and animal purchases. It needs, however, to pay increased attention to the issue of adequate collection procedures and the administration of loan repayments. In this regard the project design was weak.

1.7.5 Input Supply

PROPTA is the sole intermediary between the national equipment manufacturer, UPROMA, and field projects and institutions. Under existing arrangements, PROPTA inadvertently provides a small subsidy to UPROMA, while not always guaranteeing timely supply of equipment and spare parts. The evaluation team finds that more effective distribution of equipment could probably be carried out by the private sector.

1.7.6 Equipment Research and Development

PROPTA has played a limited role in research and development of equipment. While available equipment is generally suitable to local conditions, some problems exist in the design of some elements of the available equipment package. Staffing shortages are barriers to achieving more improvements in this area.

1.7.7 Animal Supply

PROPTA has supplied over 850 pairs of oxen to project beneficiaries, roughly 9% of all traction animals currently in use nation-wide. However, the construction of the Namiele livestock facility (to house young steers during the maturation process) may be ill-advised. A financial analysis of costs for the 1500-hectare facility needs to be performed. Projections by the evaluation team, indicate that unsubsidized livestock supplied by the facility will be priced as much as 30,000 FCFA per animal above comparable private sector supply. However, it is to be noted that private sector supply response for traction animals is not uniform throughout Togo; it is strongest in traditional livestock-raising areas of northern Togo.

1.7.8 Animal Health

PROPTA has coordinated support services and supplies for the project, although sometimes at the risk of duplicating services available from the national veterinary service. PROPTA is well-placed to coordinate animal health activities and should be further supported in its efforts.

1.7.9 Monitoring and Evaluation

M&E activity was a major priority in project design. The unit has developed and maintained an extensive data base and carried out training for counterpart technicians. Revised M&E guidelines established during 1986 with help of PPC/CDIE focused almost exclusively on output indicators, curbing somewhat the time the unit could apply to diagnostic monitoring. This has undermined PROPTA's ability to assist projects in identifying critical deficiencies in supply, technology, and institutional support.

1.8 Economic Analysis

On the basis of crop costs and returns alone, animal traction produces net income per hectare that is about 39% greater than manual cultivation in both financial and economic terms. The return per manday is around 680 FCFA with animal traction as compared to 490 FCFA for the traditional system. When all costs associated with animal traction are included, however, the differences are less dramatic, with a financial internal rate of return of 13% without credit against almost

15% with it. Though acceptable, these rates are marginal in relation to a farmer's other alternatives and are not high enough to explain the strong demand for animal traction units in the project area.

1.9 Impact of USAID Withdrawal

1.9.1 Impact on DRDRs and Animal Health Service

National policy reforms and new World Bank and FED programming indicate that project interventions will be supported and sustained.

1.9.2 Impact on PROPTA

PROPTA will be seriously affected in the areas of staffing and operating resources. The growing importance of PROPTA's equipment and animal supply operations may lead to concentrating resources in this area and thus reduce its technical programming capacity.

1.9.3 Animal Supply

Project termination will not impact on PROPTA's role in animal supply. Supply response by the private sector is an evolutionary process, already underway. High costs associated with its Namiele facility could result in increased private sector supply responses.

1.9.4 Impact on Animal Traction Extension

Extension materials and programs instituted by the project are effective and suited to new programming under a \$12 million World Bank agricultural extension project. Project termination will nonetheless remove from the scene key personnel responsible for training program development.

1.9.5 Impact on Spread of Animal Traction

Animal traction technology has been successfully implanted under this--and other--projects, and has sustainable momentum. USAID programming has been technically competent and effective in this process. Project termination will not halt this process, but will lessen prospects for necessary fine-tuning of technology and institutional support.

1.10. Restructuring PROPTA

The number of functions assigned to PROPTA is excessive. Greater effective programming might include phasing-out of PROPTA's role in equipment and animal supply. Increased emphasis on monitoring and evaluation, technical research and diagnostics, and information coordination should be supported by USAID.

1.11 Recommendations

USAID is encouraged to employ undisbursed project funds in a number of key technical areas: participant training, extension of technical assistance for training programs, and equipment diagnostics.

Several recommendations focus on the need for streamlined procedures for fund disbursement, cash management at the project level, and enhanced training of host-country and technical assistance managers.

Institutional and policy recommendations focus on supporting efforts to coordinate better animal health services and credit program administration.

2.0 INTRODUCTION

The Togo Animal Traction Project (693-0218) was intended to assist the GOT in improving, coordinating and expanding on its activities in support of the promotion of animal traction among the smallholder farmers in Togo. A.I.D. funding financed the services of a U.S. technical assistance team to assist the principal GOT implementing agencies (PROPTA and the Directions Regionales du Developpement Rural of Kara and Savanes regions) in their mandate to coordinate and expand animal traction activities in Togo. A.I.D. funding also assisted in the construction of requisite physical facilities, and in the procurement of commodities and vehicles. GOT financing financed local personnel costs as well as those associated with the establishment of a credit revolving fund to assist farmer-adopters to acquire the animals and implements necessary for converting from traditional farming methods to animal traction. The Project's intended beneficiaries were smallholder farm families living in the two impact zones.

3.0 METHODOLOGY

This evaluation is based on fieldwork carried out during the period June 8-25, 1988 in Lome, Togo and in all regions of the country designated for participation in project activities. The methodology employed included the review of project and institutional documentation, site visits, and intensive interviews with: project personnel and farmer-participants; senior regional officials and technicians of the Togolese government; Peace Corps officials and volunteers; and expatriate and Togolese technicians who are attached to projects and institutions in the Savanes, Kara, Central, and Plateaux regions. Principal evaluation activities focused on the Atakpame headquarters of PROPTA, the Kara headquarters of Projet Culture Attelee (PCA), and USAID country operations in Lome.

The evaluation team employed analytical methods appropriate to individual areas of expertise, and collaborated in activities which required a multidisciplinary approach. The team looked at technology transfer issues from a farming-systems perspective as much as possible, in order to judge the effectiveness of the project and its counterpart organizations in their capacity as providers of services to farmers. It used a broader resource management perspective to evaluate the organizational and administrative effectiveness of the hierarchy of institutions participating in the project.

The rigor of analytical activity was greatly limited by the short duration of field visits and the time allotted for preparation of the evaluation report. The evaluation team relied substantially on documentation in USAID, project and institutional archives. Such information was examined as critically as possible given the time constraint, but

unintended errors in interpretation and judgement on the part of the evaluation team are unavoidable under such circumstances. We apologize in advance for any such errors.

The methodological approach utilized in this evaluation was organic. Information gathered at various points during the course of the study was reviewed during meetings with project technicians and administrators concerned. Their responses to the team's findings prevented a number of errors of interpretation and provided critical perspective for arriving at the conclusions presented in this report.

The evaluation team was composed of:

Tom Zalla	Chief of Party/Agricultural Economist
Nicolas Kulibaba	Farming Systems/Institutional Analyst
Peter Watson	Animal Traction Specialist

In addition to its technical expertise, the team was able to bring to bear on its work sixteen years of historical perspective on the implantation of animal traction technology in the project's agro-climatic zone. Peter Watson served as a Peace Corps animal traction volunteer in Guilmarou, Benin from 1972-1976. Nicolas Kulibaba served as an animal traction volunteer in Kadjalla, Togo from 1975-1979. This historical perspective was further strengthened by the A.I.D. Representative's experience with the initial Peace Corps animal traction effort in Togo (1971-1974) and his relevant experience as an agricultural project manager for A.I.D. in Niger. Also, Thomas Cahalan, one of the members of the technical assistance team, had served as an animal traction volunteer in Kadjalla, Togo from 1971-1974. In addition, USAID's Rural Development Officer, Sidney Bliss, had served as a Peace Corps Volunteer in northern Togo from 1969-1972, as well as, occupying his present position in Togo since 1981.

4.0 PROJECT ACHIEVEMENTS AND OUTPUTS

This discussion of project achievements follows the organisation of the logframe in the project paper and the amended project paper. It is presented here to provide a summary perspective of the accomplishments of the project. The format begins with (a) the output as stated in the logframe, followed by (b) the magnitude of the outputs originally expected, (c) a review of the progress to date, and (d) the validity of the original logframe assumptions.

1. (a) PROPTA monitoring and evaluation unit set up and operational.
(b) Annual updates of technical, financial, economic and social feasibility of animal traction.
(c) M&E data base established; junior Togolese M&E personnel in training; several reports on the financial feasibility of animal traction published; no annual updates of the technical, economic or social feasibility.
(d) Invalid: data processing equipment not installed in timely manner; personnel assigned to unit not provided with adequate participant training; insufficient secretarial support sapped technical assistance resources.
2. (a) PROPTA extension programs produced and used
(b) Training materials and packages designed, tested, and in use by DRDRs, SOTOCO, and projects.
(c) On-going.
(d) Valid.

(b) Animal traction information regularly distributed to projects and farmers.
(c) On-going
(d) Valid.

(b) Ongoing blacksmith training: 40 blacksmiths for the duration of the project.
(c) 15% trained directly by project; 100% in conjunction with non-project institutions which have integrated animal traction equipment repair into technical training.
(d) Invalid; artisanal technology not suited or insufficiently developed; lag-time for market/needs response exceeds life of project.

(b) Veterinary prophylactic campaign completed.
(c) Two annual comprehensive programs completed in Savanes region, assuring health service to 4,337 cattle; structure in place for on-going follow-on to include all animal traction cattle.
(d) Valid.

- (b) 39 in-country animal traction projects using PROPTA services.
 - (c) 100%, but levels of service-use and information exchange vary widely.
 - (d) Valid, for the most part.
3. (a) Namiele cattle buying/holding center established and providing oxen.
- (b) Oxen supplied to farmers who are unable to obtain suitable pair at fair price via local dealers.
 - (c) Namiele construction 90% complete. Provisional supply operations by PROPTA 100%.
 - (d) Validity not established, due to delays in implementation; cost projections indicate assumption may not be valid.
4. (a) Provision of oxen via private marketing channels.
- (b) Animal traction adopters acquire oxen from local markets.
 - (c) Structures in place;
 - (d) Valid. Limited suitable livestock in national herd as only constraint to 100% private sector supply.
5. (a) Draft oxen credit system working on national level specifically within project zone.
- (b) Number of recipients: 806
Total loan value: Not established
 - (c) Number of recipients: 457 (56%).
Total loan value: 69,869,930 FCFA
 - (d) Invalid. Recovery system inadequate; Assumption of CNCA role in recovery inappropriate to institutional functions and programming.
- (b) Value of loan payments overdue: Not established
 - (c) Not established
 - (d) Assumption valid, but subject to default by project management
6. (a) Training support division for animal traction functioning in Kara/Savanes regions.
- (b) No specific target.
 - (c) Farmers trained: 513 in Kara Region
1,248 in Savanes Region
Programming and technical packages established for follow-on at level of DRDRs and SOTOCO.
 - (d) Invalid. Organizational functions established, but delays occur in contracting and facilities completion.
7. (a) Seventeen local technical resource centers established and functional.
- (b) Sixteen centers built, equipped and functioning
 - (c) 100%. Target figure adjusted from 17 to 16 during life-of-project, based on local need and management resources.
 - (d) Invalid. Host-country counterpart not assigned supervisory functions.

- (b) Eleven wells installed
 - (c) 100%
 - (d) Valid
8. (a) Ox-drawn units trained by project and being used in Kara and Savanes.
- (b) Number in Kara: 698
Number in Savanes: 667
 - (c) Number in Kara: 311 (45%)
Number in Savanes: 495 (74%)
 - (d) Valid.
9. (a) Farmer-adopters plow and weed with adapted technology.
- (b) LOP Total: 806
 - (c) 100%
 - (d) Valid.
10. (a) Farm land under animal traction cultivation has increased.
- (b) Average of 30% after 5 years of work.
 - (c) Average increase of 30%; limited in certain areas by land scarcity.
 - (d) Valid.
11. (a) Crop yields on farmlands under cultivation with animal traction has increased.
- (b) Food and cash crop production increased on land cultivated with animal traction on average of 20% after 5 years of work.
 - (c) No specific measure available, but evidence indicates that objective achieved.
 - (d) Valid.
12. (a) Equipment repair and parts supply set up at local level.
- (b) One private repair facility exists for every 20 (average) animal traction units.
 - (c) Limited by production at equipment manufacturing plant and inadequate inventory and supply procedures. Artisanal technology cannot satisfy all repair needs.
 - (d) Invalid.

5.0 CHANGES IN THE POLICY AND INSTITUTIONAL FRAMEWORK DURING PROJECT IMPLEMENTATION

The project has benefited tangibly from the evolution of a Togolese policy that is increasingly farming-systems oriented, and harmonious with the project's original approach.

The first phase of the animal traction project took place during a transitional period, as the government abandoned its efforts to promote subsidized tractor mechanization. Donor-led initiatives, including some thirty projects which included animal traction components, gradually attuned official policy to the benefits to be gained in farmer income and productivity through the adoption of animal traction technology. This favorable policy environment was enhanced by a series of World Bank structural adjustment programs. These led to liberalized agricultural pricing, and shifts in government financing away from parastatal-oriented production and marketing.

A revolutionary change in official rural development policy took place in March 1985, with the announcement of "La Nouvelle Stratégie du Développement Rural." This policy explicitly endorsed the promotion of animal traction technology as a primary goal of rural development activities. With particular emphasis upon intensified, field-oriented programs, the policy provided effective support for a training and visit system aimed at enhancing the quality of agricultural extension programs--a strategy entirely consonant with the TAT.

A revamping of rural development cadres occurred during the following year, following a national examination of rural development agents. The subsequent dismissal of poorly-qualified personnel and the reassignment of new and remaining agents resulted in short-term disequilibrium during the 1986-1987 agricultural campaign. However, the enduring benefits of this effort resulted in a better-motivated and better-qualified cadre of field agents cooperating with the project at the level of the DRDRs.

The policy environment for the short to medium-term future bodes well for the continuation of efforts made by the animal traction project, with revamped institutional structures assured of continuity. Imminent implementation of the World Bank-led Structural Adjustment Program III, which was negotiated in 1987, assures continuity for the "Nouvelle Stratégie" approach during the period of 1988-1990. Financing for this program will include roughly \$12 million for improvements in extension, training, and farming-systems programs, as part of an overall \$100 million multilateral package.

The extent to which lessons learned by the project will contribute to ongoing political and institutional initiatives will depend extensively upon the quality and effectiveness of end-of-project reporting, and the emphasis given by project technicians to assuring effective transition of project activities to counterpart agencies.

6.0 ANIMAL TRACTION PROJECT

6.1. Resource Management

From the very beginning the TAT project experienced problems with the amount and timely disbursement of financial resources committed by both USAID and the Government of Togo. As early as 1985 the project director and his technical coordinator reported having difficulty monitoring funds available to PCA. Administrative delays in the approval of expenditures and reimbursement and the practice of utilizing unearmarked CFA and non-project accounts for project-related costs all contributed to the confusion. It became increasingly difficult to plan project activities as the level of resources began falling below the levels approved at the beginning of the year.

Additional problems have occurred in the disbursement of budgeted funds to the project, related to complex administrative and fiscal procedures which encompass the circuit of USAID Lome, Government of Togo, and REDSO/Abidjan. Such delays have gone unresolved up to the present.

Delays in the disbursement of funds to the project resulted from a variety of factors, including:

- An overly-complex circuit of approvals. Recognized as a problem in the early stages of project implementation, procedures were streamlined appropriately beginning in 1986;
- Requests for line-item budgetary justifications by USAID project management and the time required for response sometimes delayed entire trenches of funding;
- Misunderstandings about administrative and fiscal procedures, line-item eligibility, funding availability, and programming sometimes resulted in inappropriate or unservicable requests at the project level; and,
- Reticence by project accountants regarding required paperwork sometimes resulted in lengthy delays in the submission of supporting documentation for funding requests.

The delays and shortfalls in project funding resulted in net deficits in project accounts during critical periods of program implementation. In order to cope with these deficiencies, the project has been obliged to borrow from resources in earmarked accounts and revolving funds provided by other donors.

Togolese funding of project operations has come largely from the Budget d'Investissement, with line items designated for PCA personnel, equipment and animal purchases. Government of Togo contributions to PCA operations have been as problematic as those of USAID, especially in recent years, with disbursed funds falling short of commitments and arriving only after considerable delay.

Shortfalls in anticipated resources have had their most serious impact on the ability of the project to fund livestock and equipment purchases. Recurrent costs related to salaries for project personnel (68% of GOT funding over the life of the project) have generally absorbed available funding.

Delays in the receipt of funds from the GOT amount to five or six months each year between December 24--the last date during which expenditures may be made for the fiscal year--and the date when the following year's approved budgetary allocations become available for spending. While the GOT continues to make staggered salary disbursements over this period, the equipment and livestock funds cannot be replenished. This creates a critical funding gap during the period leading up to the annual agricultural campaign.

6.2 PCA Training

One of PROPTA's primary goals was to train a nucleus of farmers who understand and practice the technology of animal traction in its totality. Besides training farmers, initially, to handle the animals and equipment, PCA has to develop a system that would serve farmers continually as they adapted the package to their needs.

To achieve this goal, the project developed a training strategy that involved new farmer training at CAT Centers, training of trainers at the CATs, and follow-up training of farmers and trainers at the farms of experienced animal traction farmers called "Model Farmers". Training was designed "from the bottom up", with themes addressing the varying training/re-training needs of farmers and extension agents. Integration of these themes into the more general extension package offered by the DRDRs is a longer-term goal of the project. In the Savanes Region, this is already occurring as a result of PCA training activities. It is significant that the project was able to design and implement this plan at a time when a country-wide revision of the extension system was taking place.

Nearly 900 new farmers, over 1,000 experienced farmers and several hundred extension agents and supervisors received animal traction training from PCA. Most training was "hands-on", teaching or reinforcing practical skills in conjunction with some theory and discussion. While the numbers

are good indicators of the general intensity of PCA training activity, they also reflect an overall strategy aimed at quality. Nearly all animal traction farmers receive follow-up training on important field operations and farm planning approaches--either through PCA programs or DRDR programs strengthened by PCA. A better indicator, perhaps, is seen in the number of projects that have approached PCA for training programs or advice; SOTOCO, FED, DRDR, FAO-BENIN, PROPTA and others. In the Savanes region, where there are 6-7,000 animal traction farmers, PCA trainers have observed that participation levels in many refresher and re-training sessions are so high that it is difficult to provide "hands-on" time for everyone. This was also observed when a member of the evaluation team attended, unannounced, a scheduled "Weeding Field Day" in a SOTOCO zone on June 21. The SOTOCO staff had notified 25 area farmers about the demonstration/training session. Twenty-two came--an impressive show of interest on a day following an important rainfall. The program featured use of weeding wings, single animal weeding systems, and a session on animal health care and equipment maintenance.

PCA training programs are worth examining in some detail, since they import valuable lessons for future efforts.

6.2.1 Extension Agent Training

As a result of several years of experience working with extension agents in training situations, PCA developed an "Animal Traction Course for Extension Agents". The 12-day intensive course was offered for the first time early in 1988, with CAT Centers used as training sites. Technical instructions were provided by DRDR sector chiefs and agricultural advisors, SOTOCO animal traction specialists, PROPTA and the national veterinary service. Content included practical and theoretical aspects of animal training and care, equipment use and maintenance, and cropping techniques. A copy of the program is included as Annex A.

6.2.2 Practical Training Field Days

In response to the critical need for follow-up training refresher sessions on animal health, field implement adjustment and cropping procedures, the project developed an innovative program of field days. Implemented at the sector level during the rainy season, the field day program brings farmers and extension agents together for a day of hands-on training in the field of a Model Farmer. Practice includes soil preparation, weeding, forage production and animal care, with more specific contents adapted to the needs/interests of farmers in two different regions. Attendance at these programs has been very high. A copy of the program is included in Annex A and summary of farmers trained is presented in Annex D.

More impressively, PCA has developed training programs that have already been incorporated into the DRDR's "training and visit" calendar (Annex A6-6). The "training and visit system" is the backbone of Togo's New Extension Strategy. Five of the 23 themes for the Savanes Region's 1988 calendar are animal traction specific. The fact that the DRDR has recognized the importance of animal traction in the Savanes and incorporated key themes into its standard extension program is a process indicator that confirms this major accomplishment of the project.

6.3 PCA Delivery Systems

6.3.1 Centres D'Appui Techniques(CAT)

The CAT centers were designed to be the centerpiece of the project's extension strategy by serving as training centers for farmers and field agents; stocking points for cattle, equipment and veterinary supplies; and as sites where cropping trials and related equipment testing could be carried out. Five centers were established in the Kara Region and five more were established in the Savanes Region during the course of the project.

The idea for CAT Centers grew out of an animal traction center that was established in Tanguieta, Benin during the UNFAO project there. The success of that center, and some of Togo's CATs, arose from a combination of factors, including proximity to antrac farmers, availability of spare parts and other supplies, and provision of services such as animal training, farm skill training, and equipment repair at the center. But there is considerable variation in the look, purpose and performance of CAT Centers, making it difficult to evaluate the overall impact of the strategy.

CATs are needed distribution points for the project's technical package. Implements and carts are delivered to CATs for distribution to new farmers. Cattle are kept at those centers where new-farmer training programs are held. Yokes, harnesses, hitches and spare parts are made at some CATs and distributed to others where there are no production facilities. Most importantly, CATs are the locations where most new farmers receive "basic training"--four weeks of hands-on work with cattle and equipment that is included in the price of the technical package.

CATs are being used quite heavily in the off-season for new farmer training and training-of-trainer activities. During the life of the project, 900 new farmers and several hundred extension agents were trained at CATs, with program length ranging from one day to 4 weeks.

Based upon the training seen at the CATs during the evaluation, and judging from the training program outlines, the overall quality of information and the methodology developed for training at the CATs is excellent. The trainers have much to do with this. Their skill is attributable to the fact that they have a lot of experience using animals and equipment in demonstration fields. The TA agronomist and animal health/training specialist were instrumental in developing the programs, with the project coordinator and the project director successfully marketing the product to the DRDRs.

Getting CATs to function as year around demonstration and resource centers has proved more difficult. Some CATs are too far from concentrations of farmers to serve as good locations for demonstration fields or for spare parts distribution--at least for the present. Demonstration fields are not always well tended. Although CATs were envisioned as sites where cropping trials and demonstrations would be held, not many of the staff associated with these centers have the time, or skill to conduct trials. At some of the CATs visited, inventories of important spare parts such as plowshares, ridger points and bolts were depleted. Moreover, veterinary supplies were not available at any of the CATs visited, though some of the centers reportedly do stock at least some vet supplies.

Seasonal "Field Days" -- training or retraining sessions in key field operations held at the centers -- were expected to be a key component of the CAT extension strategy in the project paper. However, trainers have observed that there is better attendance and participation when the same programs are held in the fields of "Model Farmers". Peace Corps Volunteers observed that farmers relate more easily to training held in these on-farm settings, where conditions are similar to their own farm. Moreover, they suggest that the stables, pens, storage areas and other facilities at CATs are unlike those which a farmer would build for himself, contributing to the general perception that CATs are demonstration farms -- not good examples of the realities farmers encounter in their own fields. The evaluation team was not able to talk with many farmers about the usefulness of CATs, but those contacted cited location and lack of spare parts as the main problems.

In spite of their problems, CATs remain an important resource within an extension system that is gradually responding to the farming population's new and fast-growing interest in animal traction. It will take years before the many services and activities supporting animal traction are supplied through private sector channels. In the meantime, farmers will seek support where they can get it. To this end the CAT centers need to provide more suitable model packages for farmers. This should include such things as a small stable made from local materials, a compost pit under the animals rather than to the side, and a simple shelter for hay, also

made of local materials. They need to concentrate on better managed, smaller adaptive research and demonstration plots and free agents for spending more time visiting farmer groups or for producing crops for their own account using recommended practices.

6.3.2 PCA Input Supply

Prior to the project, the lack of a reliable supply of spare parts and other agricultural inputs was perceived to be a major impediment to the spread of animal traction. To address this problem, the project has upgraded the CATs and given them the responsibility of providing a reliable supply of essential inputs. The PCA administrative structure, via PROPTA's relationship with UPRONA, is responsible for supplying the centers with the necessary materials. In addition, the training center at Agbassa manufactures yokes and distributes them through the CATs. All inputs sold through the CATs are sold for cash, except for new equipment packages which are available on credit.

There is little doubt that spare parts and veterinary supplies are significantly more available now in the project area than before the project began. When the evaluation team visited the CATs they had just received this year's supply of parts. Inventories were generally good, though for some key parts, such as points for the ridger, three fourths of the supply for the year had already been sold. Where the local veterinary agent was not doing so, some of the centers were also stocking veterinary supplies.

In spite of progress relative to the situation prior to the project, there continue to be fairly serious problems with the supply of essential spare parts in the PCA project area. Frequently used inputs are commonly out of stock early in the season. Input records on the annual sale of specific parts were not available at the centers, even though the center chief was responsible for determining the amounts to order for the entire year.

The problem begins with the failure to clearly define the lines of responsibility within the CATs as to replenishing the supply of spare parts. Some center chiefs see their responsibility as ending once they notify the sector chief of the problem. Some of the sector chiefs see the responsibility as being partly theirs and partly the responsibility of the PCVs. Many PCVs feel that they are only frustrating the process of institutionalization of supplying spare parts when they play an important role in the process.

Weak inventory management sometimes adds to the problem. Many of the center chiefs do not think about ordering replacement parts until the last piece is sold. When they do order, failure to understand the proper procedures can result in unnecessary delays. Where PROPTA centers are not yet operating, and for the annual replenishment of stocks, the CAT orders are gathered at PCA for transmission to PROPTA. This past year, for example, the center at Bina-Sud ran out of key parts in mid-October. After some confusion over the proper procedures to follow to order, the center chief passed his order to PCA via his sector chief in November. PCA then waited until it had orders from all the CATs and placed its order with PROPTA on January 6, 1988. In March, PCA withdrew its order because it did not receive the amount of money requested in its budget submission to the GOT it had expected. It resubmitted the order in April, and finally received the parts from PROPTA in late May. It was June by the time some centers had their parts, at least eight months after the part was out of stock.

Problems with input supply have been raised on a regular basis in the monthly meetings with project field staff. If a clear policy has been defined regarding who is responsible for ordering and managing inventories, it is not being applied in such way as to resolve that part of the problem. There is no evidence of any kind of training or any attempt to install a management system for managing inventories, as opposed to accounting for sales, nor evidence of disciplinary action taken in those situations where problems have persisted. Clearly defined administrative procedures are being followed, to be sure, but still a lack of timeliness of supply persists.

If it takes a year to get spare parts, then the PCA needs to begin the process a year before it needs the parts. It also needs to maintain a large enough inventory at a central level so it can handle any requests for spares while the next year's order is being filled. Finally, it is absurd to try to run an input supply operation with nothing more than an annual ordering system. By now PCA should have in place a monitoring system that reveals the amount of each part sold by month by center, or at least for those months when the center had the part in stock. It should be able to project annual sales to within 15% of actual sales for each part (as opposed to new equipment sales which are more subject to political decisions), and should be managing a combined center and buffer stock of parts equal to a minimum of three months supply and a maximum of four months beyond the expected delivery date of the next shipment.

From a design perspective, these problems may have been avoided, or at least resolved more quickly, if a more effective and comprehensive monitoring system had been in place. To this end, it would be helpful if the original project design contained some guidance for the kinds of information that would

normally be useful for monitoring the performance as opposed to the output of different aspects of various projects. Projects with monitoring and evaluation components need such guidance to be able to obtain some guidance for setting up useful systems.

6.4 PCA Credit Program

There is little doubt that a credit program is critical to the success of the TAT project as measured by conventional USAID output indicators. Relatively few farmers could afford the large investment required if they had to pay cash. Farm level interest rates (50-75%) are simply too high to make any but the highest return investments profitable for a farmer who must borrow at village level interest rates. By providing credit at rates that more closely reflect modern sector interest rates, the project is trying to promote a more efficient allocation of modern sector investment resources. In the process it is making animal traction technology profitable for many more farmers than would otherwise be the case.

The PCA component of the TAT Project has been operating a credit program for the purchase of animal traction animals and equipment. Financing for the program comes from the Togolese government and is managed through an account at the CNCA. At the present time the PCA approves loan applications, distributes credit and collects payments. The current system for accounting for credit program resources was put in place and is being monitored by a consultant provided by REDSO under a regionally funded IQC.

According to the PCA 1987 annual report the PCA credit program had provided loans amounting to a total of 100 million FCFA to over 680 farmers as of 12/31/87. The credit was mostly for oxen/equipment packages. Initially, the traction animals came from PROPTA. More recently, farmers have been identifying their own animals and then arranging for project financing to cover their purchase.

In terms of critical performance criteria the project has improved management of its credit program. Repayment rates, which were 24% for the pilot project, rose to 36% for all of Kara Region in 1985, the first full year of the project, to 64% in 1986 and are now up around 90%. The low rate for 1985 was due in part to the fact that the cut off date for the annual report was December 31, 1985 whereas for other years the cutoff date was toward the end of February or later. (For more on performance of PCA credit program, see Annex B.)

In 1987, repayment rates for PCA experienced some difficulties because of the diffusion of responsibility for the collection of repayments created by "La Nouvelle Strategie". In those areas where SOTOCO has assumed responsibility for extension it has also assumed the role of collection agent for PCA loans. Delays in transmitting to SOTOCO the names and the

amounts of payments due, meant that SOTOCO was not able to begin collecting until the beginning of the cotton buying program. Moreover, because some of these farmers do not grow cotton, SOTOCO is not able to use its established procedures to recover credit repayments. This resulted in non-cotton growing farmers not being approached concerning repayment until well after their crops had been sold. Special procedures for SOTOCO to follow when a farmer does not grow cotton and what actions SOTOCO should take in dealing with non-payers need to be established.

Conventional wisdom in Togo is that SOTOCO has such high repayment rates because it can effectively attach a farmer's cotton crop to effect repayment. While there is certainly some truth in this observation, it is by no means the whole story. SOTOCO also has an established credit policy that it follows to deal with various situations. The benefits of this policy are seen in the steadily rising repayment rates in the Savanes Region as the SOTOCO program has become better known. The repayment rate for 1988, for example, had risen to 98% as of the end of March, 1988.

SOTOCO's policy is to seize equipment and animals with no reimbursement for amounts already paid if a farmer misses his payments for a second year. As draconian as this sounds, SOTOCO indicates that it has seized only four sets of equipment in the Savanes, the region accounting for 90% of its credit activities, since 1984. These came from farmers who were no longer interested in using the technology. According to the person responsible for the credit program, most farmers find the money when faced with the threat of losing their equipment. This example demonstrates one of the paradoxes of credit programs. The more carefully designed and applied are the qualifying criteria, the more clearly defined are the consequences of not making payments on time, and the more likely those consequences are to occur, the less likely one is ever to have to apply them.

PCA needs to review its credit program with the aim of developing and strengthening a comprehensive credit policy and management system. The accounting side of the credit program appears to be strong, but management of repayment schedules and collection could be reinforced further. For example, all loan agreements should indicate the amount of a farmer's annual payments and the date by which they were due. Also, the individual loan records should contain information on why the farmer had not paid or what action had been taken to try to correct the situation. Invoice for payments should be sent around harvest time and not two to three months after farmers had harvested and sold their crops. Doing the latter often results in low repayment rates.

There are other documentation improvements that should be made. For example, there is no document whereby a farmer indicates what he wants to order and confirms his order with his signature. His order is taken orally by the encadreur. When the equipment is delivered, the encadreur rather than the farmer sign the bill of lading. In the event of diversion by an encadreur the project may not find out until someone gets around to visiting farmers who are in arrears.

In summary, the evaluation recommends that PCA do the following:

- 1) More clearly define a system for monitoring the results of the program on a monthly basis and reporting these results to the director and establishing central documentation on reasons for late payments;
- 2) More clearly define the conditions which warrant leniency with respect to deficient loan repayments and the actions that should be taken when these conditions are or are not met;
- 3) Regular reviews to determine whether a particular farmer meets these conditions and what action to take (this review process should be documented); and,
- 4) Timely taking of appropriate actions.

6.5. Adaptive Research

An important goal of the project has been to introduce farmers and extension agents to the technological options presented by animal traction, and to help them develop farming systems based on sound agronomic and economic practices. Animal traction offers Togolese farmers affordable alternatives to laborious "hand-hoe" systems, and to high cost tractor systems.

Matching equipment packages to the farming systems in the project zone is a project initiative that necessarily extends beyond the life of the project. Variability in agroclimatic zones and in cropping patterns; the lack of exposure of farmers, extension personnel and project staff to time-tested animal training techniques, yoke and harness designs, and to hitching, steering and braking systems; and introduction of the "New extension Strategy" have all contributed to make the adoption of the well integrated animal traction farming systems a complex, time-consuming endeavor. The Project Paper recognizes that animal traction is complex technology that takes 15-20 years to master, and that adaptive research is a process to be put into motion--not a goal to be realized.

The following observations are offered as indicators of the sort of progress that has been made, and of the challenges that remain.

6.5.1. Cropping Farming Systems

Most of the manual cropping operations performed by Togolese farmers can be accomplished using animal-drawn equipment, with the exceptions being yam-mounding and multi-cropping on broad ridges. Since it takes years for farmers to develop cropping systems that take full advantage of animal powered technology, the TAT project sought to teach farmers principles that would help them to master the technology over time.

New animal traction farmers tend to use the technology for primary tillage (soil preparation) and attempt to perform subsequent operations with traditional methods. This common problem was seen by the PCA in the Kara region where, four years into the project, only one third of the farmers surveyed used their animals for weeding. In the Savanes region, nearly all farmers used ridgers for primary tillage and fewer than 20% performed follow-up operations with animal traction. (Source: PROPTA reports, "L'Emploi de la Culture Attelee dans la Region de la Kara", 1988; "L'Emploi de la Culture Attelee dans la Region des Savanes," 1988).

Although these modest results reflect the need for continued extension work, the evaluation team notes that they are much better than results obtained in many projects. Clearly, the PCA agronomic program identified and addressed the problem early on, focusing on row spacing, seeding methods, and weeding techniques as critical components of an animal traction farming system. At the same time, PCA taught farmers the importance of forage production and manure use, and provided appropriate demonstrations and training.

The criteria used by the project to select "model farmers" reflects the farming system approach taken by the project:

- farmers own equipment appropriate to the system;
- production system includes weeding, manure use, and forage production;
- practices related to animal health and nutrition, and equipment care and maintenance are exemplary;
- model farmers use improved agronomic practices such as new varieties, fertilizers, higher seeding rates to avoiding replanting delay, etc;

In all, fifty model farmers were selected during the past two years. Their farms are sites for increasingly popular field day training/retraining programs. Innovations resulting from the work of these farmers include improvement of weeding wings, improvement of the weeding triangle through use of stabilizer teeth, and the introduction of a new peanut-lifting technique.

6.5.2. Equipment / Technical Package

The line of animal traction equipment manufactured by UPROMA and offered through PROPTA provides farmers with a selection of field implements and vehicles that meet a variety of needs. The project sought to stimulate research on equipment needs and options, test existing and proposed designs, and work with PROPTA, UPROMA, and the private sector to improve the overall equipment package... all with the goal of equipping farmers with affordable, efficient, labor-saving means of production.

PCA has equipped nearly 900 farmers since the outset of the project. Equally important PCA equipped farmers with the basic skills needed to use the equipment. It also offers farmers programs to improve and upgrade these skills. The linking of tools with the skills needed to use them is the principal element of PCA's "technical package"--which is a good bit more than an "equipment package".

Improved weeding practices used in the project zone are a direct result of PCA's emphasis on systematic equipment use. The technical package was designed with the purpose of helping farmers avoid the classic "weeding bottleneck" that results when more land is plowed than can be weeded by hand. Dozens of past failures have taught extension specialists that teaching farmers about the interdependence of animal powered farming operations is easier on paper than it is in practice. It is no small achievement that PCA can report that more than one third of its farmers practice weeding (PROPTA, 1988). As a result of the 1987 "Field Days" program, 50% of first year farmers in several sectors in the Kara Region were able to mechanically weed some of their fields.

Single-animal weeding harnesses, locally forged weeding wings and preseeding harrowing techniques developed by PCA are other components of PCA's technical package, and all point to the success of the approach. The weeding wings are an important and appropriate tool for farmers in the Savanes Region, where 97% of soil preparation is done with a ridger. The wings attach to the ridger core and permit farmers to weed the sides of ridges mechanically. Single animal harnesses are being introduced in both regions; based on a Burkina design and adapted for local cattle. The harnesses are a great improvement over the yokes used during the pilot period.

Local production and availability of spare parts, yokes, harnesses and hitches has increased through the project's work, but further efforts are needed in this all-important area. Currently, the Agbassa CAT is the only Project-supported artisan center. PCA reports having trained 20 blacksmiths in the Kara region, primarily through the efforts of a French

volunteer. It is disappointing that in the Savanes Region, where there are more farmers and greater needs, nothing was done.

Through the project's efforts, several modifications to UPROMA equipment were made. The SR-1 Rotary Seeder has an improved seed box and was equipped with shovels to cover seed. The life of original and spare parts will be increased through a new system for tempering steel. The axle for the plow wheel was redesigned for easy replacement. Most importantly, in response to the project's work with UPROMA in refining equipment, UPROMA has begun making its own field surveys of equipment performance.

To support efforts to evaluate equipment needs and to improve designs, USAID has hired an animal traction equipment improvement coordinator. He will work at least through the end of 1988 or longer, if funds permit, and the recommended extension of the Project through June 1989 is approved. See Annex H for more details on equipment and technical problems.

6.6 PCA Animal Supply

The project paper noted difficulties in obtaining sufficient animals for draft purposes, especially in Kara Region. PROPTA was created, in part, to resolve this problem. The expectation was that, in time, the private sector would respond and PROPTA would no longer be necessary as a supplier of draft animals.

Up until recently PCA was obtaining most of its animals from PROPTA, both in the Savanes and in Kara Regions. Beginning this past year, however, PCA began allowing farmers to identify their own animals, as SOTOCO has been doing for several years. Once the veterinary agent confirms that a particular pair is suitable for traction purposes, PCA then provides financing. Farmers are thereby able to save about 25,000 FCFA on the purchase price of their animals. The FED-Kara project intended to take the same approach this year but ended up once again getting most of its animals from PROPTA. The evolution of PCA deliveries and training of draft animals in the project area is summarized in Annex C.

The pattern of evolution one observes in Kara Region follows that which occurred in northern Benin, Ivory Coast and in the Savanes Region of Togo. Once animal traction becomes established and a significant demand for traction animals develops, private sector suppliers begin to appear to satisfy it. One of the evaluation team members who worked with animal traction in northern Benin 12 years ago remarked on the tremendous increase in oxen in that area now as compared to then.

As demand for traction animals develops more farmers begin raising out their own calves to replace their own animals. Traders begin drawing supplies from farther afield. Older females begin replacing younger males as a source of meat. Although we have no specific evidence to cite, one probably would observe that the price spread between younger females and males also narrows. This is the result of the private sector responding to the increased opportunities presented by animal traction.

The evolution of events with respect to the supply of draft animals in the PCA project area proceeded just as expected in the project paper. PCA appears to have seized the opportunity when it presented itself to expand the role of the private sector in animal supply in Kara Region. This is one of the more significant achievements of the project and promises to assure the supply of draft animals in both the Kara and Savanes regions beyond the PACD.

6.7 Animal Health

The project has recognized the importance of prophylaxis, animal nutrition, and treatment as critical components in the successful transfer of animal traction technology. Working in an environment where available veterinary services are extremely limited, and where animal traction farmers are often unfamiliar with animal health requirements, the project has successfully implemented a range of remedial programming.

Beginning at the most basic level of animal health, the project has emphasized the role of year-round animal nutrition, integrating dry season forage and generally available by-products of traditional crops into recommended cropping systems in the Kara and Savanes regions.

Capitalizing on the role of extension agents as a primary medium for farmer education, the project has produced a series of valuable "fiches techniques" on the subjects of dry and rainy season nutrition for traction animals, as well as documentation to aid in the diagnosis by non-specialists of animal health problems.

However, the limited availability of animal health services has been recognized by project technicians and regional officials as an impediment to increased and sustained adoption of animal traction technology in Togo.

Programming by the Government of Togo's Animal Health Service is concentrated in three areas: prophylaxis (annual vaccination campaigns), meat inspection at markets, and animal health care in the case of injuries or disease. Operating with relative administrative autonomy, a heterogeneous mandate, and

scarce resources, the Animal Health Service has yet to be adequately integrated into animal traction programming. Ministerial reorganizations in recent years have been encouraging, bringing the animal health service under the direction of the Ministry of Rural Development. However the operational autonomy of the Service remains an object of criticism.

In order to better appreciate the dilemma faced by the project in this domain, it is necessary to examine human resource distribution within the Service.

Distribution of Animal Health Services
in the Kara & Savanes Regions

				Ratios	
	Sectors/ Posts	Number Agents	Km ² Agent	Cattle/ Agent	Animal Traction Cattle/ Agent
	-----	-----	-----	-----	-----
KARA	7/15	9	1,292	7,444	176
SAVANES	2/15	14	573	6,214	1,089

Density of livestock populations in the two regions varies widely, although on-the-ground ratios of veterinary agents to livestock bears no direct relationship to this phenomenon. In certain areas where livestock populations are high, the ratio of cattle to veterinary agents may be high. Such is the case of the Bassar sector of the Kara region, where only 4 Chefs de Poste are responsible for animal health services for approximately 32,000 animals, a ratio of 1 agent per 8,000 cattle.

Proportionately lower veterinary agent/livestock ratios are noted for major population centers, where administrative responsibilities and meat inspection play a more important role. For example, the Kozah sector of the Kara region is assigned three veterinary agents, with a ratio of agents to cattle of only 1/2,833.

Where the number of veterinary assistants--junior personnel with training in only rudimentary animal health care and vaccination procedures--are added to that of senior staff, the effect on the availability of health care per post is little changed, as junior agents are rarely provided with means of transportation adequate to their needs.

The evaluation team noted chronic complaints, readily acknowledged by Animal Health Service officials, regarding constraints on field visits and demands by veterinary personnel that farmers who request on-site treatment of sick and injured traction animals reimburse agents for travel costs.

According to veterinary health authorities in the Kara, Savanes, and Plateaux regions, this problem is explained by the following factors:

-Allowances due to veterinary agents for the operation and maintenance of their vehicles are subject to chronic delays averaging between three and six months. Combined with frequent salary arrears, these place the agents in a position of being unable to carry costs incurred in their work;

-Not all agents are endowed with official means of transportation. Hence they must utilize personal vehicles which do not benefit from travel allowances, or else they must rely upon public transportation;

-Although the practice is officially not condoned, veterinary agents regularly supplement their income by charging for services rendered and travel costs, including during ostensibly free official vaccination campaigns. This practice has continued even where treatment and transportation have been subsidized by the project.

An additional impediment to animal health care is the problem of payment arrears for health services rendered, generally related to pharmaceuticals and related products. While the evaluation team was unable to examine this problem on a comprehensive basis, it was able to establish that arrears on payment to a number of animal health posts ranged between 3,500 Francs CFA per month to as high as 92,000 FCFA. In cases where individual farmers are in arrears, veterinary agents may withhold services until payment is made.

Animal health service officials have acknowledged an additional problem in the pricing of pharmaceuticals and treatment by their agents. Profiteering through mark-ups on the price of pharmaceuticals by agents is an established practice which farmers and herders recognize as being an arbitrary phenomenon. This, in turn, has resulted in reticence regarding payment.

The maintenance of adequate veterinary supplies at animal health service posts is an additional problem in the project zone. While the project has sought to assure the maintenance of basic medicines and supplies in its areas of concentration, inadequate inventory and supply procedures within the animal health service remain a serious problem.

The traditional autonomy of the animal health service has resulted in a vestigial reticence by its agents, who oppose the sale or distribution of veterinary products by other agencies.

For example, many CAT centers, which have served as a hub of animal traction training, extension, and equipment supply, maintain no inventory of animal health supplies, even in areas where there are no nearby animal health service facilities.

Rectification of these problems is necessary to assure the financial and professional integrity of the animal health service over the long term, as well as to instill confidence among its clients. However, the existence of contradictions in policy and practice must be resolved first through the establishment of rational administrative practice.

6.8 Participant Training

While participant training was included as a critical element in project design, the lack of a training needs assessment resulted in a lower than planned level of participant training.

Combined available resources provided for in project funding were \$40,000, of which only \$7,882 was disbursed by the end of 1987. An extension of the Project through June 1989 would, however, allow for much of this planned amount to be utilized.

The principal impediment to the use of participant training resources was the failure of the technical assistance team and USAID project management to implement a training needs assessment and schedule of training in a timely manner. No program for training has been identified yet at PCA. A PROPTA needs assessment and training program was developed, however not until mid-1987, when long-term training was precluded by the imminent end of the Project. The planned project extension would therefore resolve most of this problem.

Participant training provided to the project and financed by project funds or regional training resources included the following:

- International Institute for Tropical Agriculture (Nigeria);
Workshop on alley cropping; March 10-14, 1986.
Participant: Koffi Eklou-Takpani (Forage Agronomist);
May 5-21, 1986. Participants: Soga Ali (Chef d'Agriculture, Gando) and Yaovi Gato (Chef Secteur, Kabou).

- ICRISAT, Niamey, Niger; Information visit, 1986.
Participants: Dr. Moutiou Domingo, Dadja Assih (PROPTA).
- International Institute for Tropical Agriculture (Nigeria); training course on food crop research, production, and use; April 7-May 2, 1986.
Participants: Agbouta KoKoa, Bdaby Boraze.
- Farming Systems Support Project workshop, Freetown, Sierra Leone. September 17-22, 1986.
Participants: Dr. Kossivi Apetofia (PROPTA), M. Afantonou (Director, UPRONA).
- U of Michigan, Ann Arbor; CRED Seminar on Rural Economy. June 23-August 17, 1988.
Participant: Klutse Abatekoue (PROPTA, Division de la Programmation, de l'Evaluation et des Statistiques).

While the benefits of short-term training in the above programs have had a positive impact on project implementation, further training is needed.

Serious questions are raised about the existence of competent human resources to replace the technical assistance team once project activity is ended. The ability of the PROPTA monitoring and evaluation unit to continue to function in the absence of a sufficiently qualified specialist is doubtful, in spite of commendable in-house training efforts by the technical assistant assigned to that unit. The absence of any identified animal traction technology specialists at the level of DRDR Savanes and Kara is almost certain to have a detrimental effect on host-country follow up to project activities.

7.0 PROPTA

PROPTA was created to oversee the essential elements of a farm management system which uses animal traction. It is responsible for facilitating the interplay of the full range of government, donor and private animal traction-related policies and activities. Under the TAT project PROPTA is to train extension agents, monitor and evaluate on-going activities of the various animal traction projects in Togo, assure an adequate supply of traction animals, equipment and spare parts to projects and farmers, and has responsibility for rationalizing subsidy and credit policies for equipment and draft animals.

7.1. Information Services

PROPTA's role is to promote animal traction in Togo. It is charged with coordinating and harmonizing animal traction related policies and extension efforts, improving information flows between projects, and helping the farming community understand the uses, costs and benefits of animal power.

PROPTA has done much to coordinate and foster the activities carried on by Togo's 30-plus animal traction projects. It has also helped establish the "image" of animal traction as a viable tool for agricultural production. On a wider scale, increasing recognition of the importance of information collection and exchange substantiates PROPTA's role as a central resource within the growing network of regional, national and international animal traction projects. PROPTA's leadership as an organization promoting animal traction is recognized by the West Africa Animal Traction Network, which has asked PROPTA to help organize its 1988 Conference, to be held in Saly, Senegal in July.

More than twenty Togolese animal traction projects use one or more of PROPTA's services, which include training, technical information, equipment and supplies, and extension. Over fifty projects and government services provide information to PROPTA, including all DRDRs, all regional veterinary services, and over a dozen international projects. Beyond this, PROPTA's outreach has been strengthened by the publication of "Force Animale", a quarterly technical bulletin which is offered on a subscription basis to projects and individuals. At the beginning of its second year of publication, its circulation is 1,000.

In an effort to develop a strong information base, PROPTA has collected and cataloged over 1,500 manuals, technical papers, project reports and other information about animal traction. This ongoing effort makes PROPTA a key information resource. A limitation of the library is that some good technical materials are in English and cannot be easily used by PROPTA's staff.

At the same time, PROPTA is publishing its own information. Memento de la Culture Attelee -- a 150 page illustrated manual on animal traction -- is written as a "how-to" book for Togolese animal traction projects, focussing on technical options and procedures used in field level extension work. The manual will be published within the next 6 months. Back-up training materials include 19 "Fiches Techniques", or technical flyers, dealing with fundamental topics such as animal health, yoke patterns, field operations, etc.

Unfortunately, these successes are diminished by the publication of some poor equipment designs, and some inaccurate or incomplete information on technical procedures...all of which point to an oversight in the Project Paper. From the outset of the Project, PROPTA has worked with only intermittent assistance from an animal traction specialist. The lack of an on-staff/on TA team agricultural engineer or antrac specialist has resulted in a number of problems, including promotion/production of yokes which are inefficient and can be injurious to animals, purchase of equipment clearly unmatched to the pulling capacities of project cattle, and general employment of faulty animal training and hitching procedures.

Although AID and project management finally recognized some of the problems and hired late in the project period an equipment specialist to work with PROPTA, there will be a need for additional support with its efforts to correct and fine tune its technical publications. Memento de la Culture Attelee should be reviewed by an animal traction specialist or agricultural engineer with animal traction expertise, before it is published. At the same time, "Fiches Techniques" could be reviewed so that problem areas are revised before reprinting.

7.2 Resource Management

As in the case of PCA, the PROPTA component of the project was beset by numerous problems related to the amount and timely disbursement of financial resources committed by USAID and, to a lesser extent, the Government of Togo.

The most serious difficulties occurred in the earliest phases of project implementation. No advances against PROPTA expenditures and operations were made by USAID between August 1983--the start-up date of the project-- and January 1985. Hence, the first stage of project activity took place in an atmosphere of financial austerity which had evident impact on programming and bilateral good will.

The effect of tardy disbursements on PROPTA activities was compounded in 1985-1986 by a similar problem with another of the organization's key donors, the Fonds Europeen du

Developpement (FED). In order to sustain its operations during this period, PROPTA found it necessary to borrow from existing revolving funds, which are earmarked for livestock, equipment, and veterinary supply purchases. While such borrowing from earmarked accounts was encouraged by donors as a crisis management tool, it established a questionable precedent for the administrative and fiscal integrity of PROPTA.

Government of Togo contributions to PROPTA activity, funded from the Budget d'Investissement, are principally expended on the salaries of core PROPTA staff, as well as on maintenance of operations. Additional funding during the earlier stages of the project were drawn from extrabudgetary accounts designated by the government for PROPTA expenditure.

While the evaluation team did not have sufficient time to analyze Government of Togo contributions during the life of the project, PROPTA officials reported several problems in this domain, similar to those noted at PCA.

Fiscal constraints have reportedly forced the Government of Togo to reduce budgetary allowances to PROPTA accounts during the period 1986-1988, as part of the national fiscal austerity program. Notification of budgetary cutbacks has not, however, taken place until the beginning of the fiscal year, when work programs are already underway. Furthermore, authorizations for spending have regularly been delayed by as much as six months every fiscal year, generally during the critical period of activity leading up to the annual agricultural campaign when funds are most needed.

7.3. PROPTA: Training

One of PROPTA's most important functions is to provide leadership in the development of training programs and related curricula. In the PP Amendment (February 1986), training is cited as PROPTA's weakest point, with the most obvious need being the appointment of a high level professional with training experience, training of trainer expertise, and knowledge of animal traction to head the division.

To meet the need, PROPTA appointed a new Chief of the Division of Training and Agricultural Equipment, whose many responsibilities were shared by a German volunteer. The result was that in 1987, PROPTA increased its training effort significantly, improving the form and content, and tripling the number of training sessions offered. The increased training experience was complimented by the efforts of Peace Corps Volunteers who helped the Division produce "Fiches Techniques" and the Memento de la Culture Attelee, which constitute, at this point, the whole of PROPTA's training material.

What remains to be done is to follow up on the training content outlines developed over the past two years, and to format them along the lines of PCA materials (Annex A). In this way, PROPTA can begin to develop a bank of training components which trainers from various projects and different agroclimatic zones can draw upon. When an organization comes to PROPTA for materials on soil preparation, for example, a full range of components could be offered: plowing/seeding; plowing/harrowing/seeding; scarification/seeding; scarification/ridging/seeding; ridging/seeding. Each component would have a detailed, step-by-step guide for a trainer teaching the technique, including equipment preparation and adjustment, field layout, practice, theory, and review. A "Fiche Technique" would serve as back-up material.

It makes eminent sense that, PROPTA, in its role as a coordinator of training activity, would be capable of helping any project design a training program that coincided with the particular cropping patterns/operations in its technical package.

PROPTA has made a serious effort to respond to the training needs of the Central Region, and has initiated a program that will promote and support animal traction farming in the two southern regions. It recognizes the need for blacksmith training in the Savanes, where there is a strong market for spare parts, and has placed an artisan trainer there to develop the program. In 1988, it will increase the number of training programs offered by the National Institute for Agricultural Training.

Its weak point, presently, is a staff that is limited in numbers, and which lacks the depth of experience of the PCA staff. During the evaluation, PROPTA trainers expressed their concern about the problem. They note that the replacement of the German volunteer/trainer will most certainly set back their 1988 program, since at best, it will require an adjustment/transition period for everyone. They feel that their dependence on volunteers is a sign of a system that does not yet acknowledge the need for a bigger, permanent training staff. And they concur with the observation that training sessions have not always involved the best mix of participants --combining sector chiefs with sub-sector chiefs--and have involved a good deal of trial and error. The departing German volunteer suggests that the Division would benefit greatly from training in training methodology.

All considered, PROPTA has made clear progress in the area of training, and has the potential to fulfill the role envisioned under the Project.

7.4 PROPTA Coordination of Credit Programs

The project paper calls for PROPTA to work with animal traction projects to rationalize and make more uniform the terms under which farmers purchase equipment and animals. The purpose of such rationalization was to avoid the decapitalization of project credit funds, to eliminate incentives for farmers who already own suitable animals to purchase additional oxen, and to remove distortions and impediments to credit program discipline when adjacent projects offer significantly different terms and conditions for the same equipment package.

As a means of promoting the harmonization of credit program terms and conditions PROPTA has assisted in ministerial level discussions of credit policy and has formulated proposals for reform. At the present time, according to PROPTA, virtually all projects and services have adopted those aspects of the national credit "policy" calling for one-sixth down, five year equal payments and an 8% interest rate. Apart from this, PROPTA was influential in obtaining agreement to allow CNCA to take over loan administration and repayment follow-up for several of the larger projects. This agreement, however, has been derailed by turmoil within CNCA relating to the large amount of its portfolio that is currently in arrears and a major embezzlement scandal.

The seriousness of the CNCA's financial problems weigh heavily on the Project's credit programs; and, even in the absence of these problems, it is not likely that shifting the loan collection burden to the CNCA will solve this problem, no matter what reforms are made within the CNCA. The fact of the matter is that only the projects and not the CNCA have the manpower necessary to manage a credit program aimed at dispersed farmers. This situation will not change without an unrealistic and unplanned increase in the CNCA operating budget and a significant increase in CNCA interest rates or in the GOT subsidies to CNCA.

PROPTA should be studying what is happening in the existing project credit programs. It should maintain an inventory of the terms for allocating loans and the policies followed for recovering them in the various projects. It should document credit screening and management systems that seem to be working and disseminate this information to other projects. It should solicit ideas and propose modifications in credit delivery and collection systems in small projects or on a pilot basis in order to test the most promising ideas. It should develop simple measures of technical efficiency to monitor the quality of use of animal traction equipment and determine what kinds of program discipline lead to more

efficient use of equipment. In the long run it will be the efficient use of equipment and not the "understanding" of credit program administrators that will most effectively promote the beneficial use of animal traction and facilitate loan repayment. Insisting on timely repayment is probably the best way of insuring that farmers will not adopt animal traction unless they are reasonably sure they can use the equipment efficiently enough to repay their loan.

7.5 Input Supply

One of the principal reasons for the creation of PROPTA was to overcome problems of unreliable equipment supply and unavailability of spare parts that plagued projects during the early years of operation of UPROMA, the sole manufacturer of animal traction equipment in Togo. UPROMA had insufficient working capital and an inadequate marketing capability that resulted in long delays in receiving equipment and spare parts. To solve this problem the FED determined that it made sense to give to PROPTA, a separate institution, responsibility for marketing agricultural equipment produced by UPROMA. The FED doted PROPTA with a revolving fund for prefinancing the manufacture of equipment for the various projects. As the sole distributor for UPROMA equipment in Togo, PROPTA supplies projects and individuals with both equipment and spare parts.

Though the equipment supply function of PROPTA is not technically a part of the TAT, problems with this component are such that an evaluation of the project cannot be complete without addressing this component. The basic problem is still one of long delays, now primarily in obtaining spare parts. The problem arises because PROPTA is only begrudgingly accepting that its responsibilities include anticipating the demand for equipment and parts by the projects. It does maintain an inventory for cash sales to individuals, but these are only a very small part of total sales.

There is no doubt that spare parts are now much more widely available, both in space and time, than when the project began. PROPTA deserves the credit for this. But in many ways, PROPTA's success has contributed to the perception of the problem. Farmers and projects have experienced the benefits of timely availability of spares so that they are increasingly intolerant of interruptions in supply.

The problem of long delays in obtaining equipment is aggravated by the fact that the projects themselves do not invest adequately in inventory or inventory management. The long process required to approve the tender for the equipment PROPTA orders from UPROMA also is a factor. These problems are compounded by the long delays both in billing for orders delivered and in paying for those deliveries once the bill is received.

PROPTA has been struggling to deal with these problems. Partly because of very substantial carry-overs of its 1984 order, when PROPTA did attempt to anticipate demand, it has been carrying over from one season to the next an inventory that equals over half of annual sales of equipment. Only the very last projects to order now experience delays in receiving their equipment. However the carryover from one season to the next is still excessively large.

PROPTA argues that its problems with spare parts are in the process of being resolved and that it would be unfortunate to abort this process just as it is beginning to bear fruit. To meet the needs of the projects for timely supply, PROPTA has been creating regional distribution depots. Depots now exist in Dapaong, Kara, Sokode, Atakpamé, and Lome, and others are planned for Kpalime and Tsevie. These depots will supply unforeseen demand for spare parts by the projects, but PROPTA still expects them to place annual orders for the bulk of their needs.

The evaluation team doubts that agricultural inputs will be widely available until some entity assumes responsibility for developing and supplying a rural distribution network based on forgerons and popular local general stores. PROPTA does not seem disposed to do this nor does PCA in the PCA project area. Whichever entity does it will need someone who understands well the principals of estimating market demand and inventory management. Logically, this would be UPROMA itself. UPROMA now feels the pressure to increase its production as high as possible in order to amortize its equipment and spread its overhead so as to keep its price increases to a minimum. These factors were not present five years ago when TAT was in the planning stage.

UPROMA is not anxious to change the present system, but would be willing to consider it in the context of some outside assistance for initiating the process. Part of the reason for UPROMA's reticence is the indirect subsidy it is now receiving from PROPTA because of PROPTA's financing of inventories and consolidating orders. We estimate PROPTA's costs at about 10% of sales, 6% of which is financing costs related to carrying the inventory and delaying the billing and absorbing the cost of delays in payment by the projects. PROPTA receives only 3% from UPROMA. Were UPROMA to assume this function it would have to absorb these costs. The level of such costs could be reduced to perhaps 6% of sales with better financial management, more timely invoicing of deliveries and a system of penalty charges for accounts paid in arrears. But UPROMA's costs would rise in any case.

Should UPROMA assume input supply directly to projects and individuals, rural retailers and projects would need some initial assistance in estimating demand and in managing inventories. Rural distributors will also need doorfront delivery and supplier credits until the market is developed and they can be confident of achieving a certain minimum level of sales. UPROMA is the entity that will be benefiting the most from the success of such a system. Therefore it should have the greatest incentive to make it work. This matter is worthy of closer study by USAID and the FED as a follow-on activity to the TAT. As a minimum for current action, USAID should encourage the government to increase PROPTA's margin to 10% of sales. This will greatly accelerate UPROMA's interest in assuming more responsibility for marketing its output.

7.6. Equipment Research and Development

PROPTA has had a limited role in the testing of animal drawn equipment and related cropping operations. This is due, on one hand, to the fact that the type of equipment manufactured by UPROMA and supplied through the project is generally suited to the soils and cropping patterns found in Togo. With that "given" in view--and the prospect of linking equipment testing to farmer and trainer training--it was expeditious of PROPTA to combine its equipment and training divisions and stretch limited staff resources.

On the other hand, PROPTA was not equipped, until very recently, to perform equipment research and development. A case in point is the yoke used and promoted by PROPTA--a Benin import that is poorly designed in that it limits the transfer of power from the animals to the load, and causes galls on animals' necks and shoulders. In its discussion about equipment needs and packages, the Project Paper makes no mention of yoke or harness testing, an oversight that was not discovered until early in 1988, when a specialist was hired by the Project to help PROPTA improve its equipment.

With an equipment specialist finally on staff, PROPTA can begin to study the information obtained and filed in 1984, when the TA economist contacted AID, VITA and Peace Corps about possible equipment designs and options. The specialist plans to work in the area of yoke and harness improvement, stimulation of private sector involvement in equipment supply, and testing of such implements as the hoe Manga, UPROMA seeder, row markers, harrows and weeding wings.

7.7 Animal Supply

7.7.1 PROPTA

Over the life of the project PROPTA has supplied over 850 pairs of oxen or about 9% of all traction animals estimated by PROPTA's monitoring and evaluation unit to be currently in use

in Togo. The number it supplies annually to projects and farmers has more than doubled since the first year of the project. However, PROPTA data included in Annex E indicate that this increase is only slightly greater in percentage terms than the increase in the number of teams in use nationwide over the same period.

The PROPTA data probably overstate the growth in numbers of animal traction units and, as a result, underestimate the growing role of PROPTA in animal supply. PROPTA's monitoring and evaluation unit has been improving the quality of data on animal traction units in Togo with the result that an unknown portion of the observed growth comes from better measurement of the number of existing units rather than real growth. PROPTA's deliveries, on the other hand, are known. Still, the data indicate that PROPTA is not the predominant supplier of traction animals on a national basis. Its role as a supplier is being increasingly limited to the southern regions where animal traction has not yet taken hold.

In general, PROPTA appears to be doing an adequate job of supplying projects' unmet needs for animals. It has maintained an inventory of animals that has permitted it to respond to last minute orders that ordinarily would not have been filled. And it has tried to minimize the rise in prices that necessarily accompany a quantum increase in demand for resources. There are complaints that the animals it supplies are sometimes too small to work, and this past year, that they have not always been healthy. The small size comes from PROPTA's desire to hold down the price it pays so as to minimize the price paid by farmers. Younger animals are both more available and cheaper.

The health problem allegation is more difficult to assess. PROPTA argues that some CAT centers and projects have not provided adequate veterinary care to animals they hold in inventory for distribution to farmers. The projects believe the animals were not properly vaccinated and treated prior to being shipped by PROPTA. Hopefully these problems will not reoccur.

7.7.2 Namiele

The project is financing the modification of 1500 hectares of a holding station at Namiele for the growing out of steers which are too young or small for immediate use for animal traction. Such animals are not only cheaper when initially purchased by the project, but they are available in significantly larger numbers than are more mature steers. The Namiele facility is seen as a way of increasing the supply of traction animals without driving up the price of traction animals too quickly. The facility will be run by PROPTA and is expected to contain nearly 500 animals when in full operation.

USAID is providing a total of \$115,000 to finance construction of housing for animal keepers and night watchmen, a water system and fencing. PROPTA will finance vehicles and operating costs, including purchase of the animals. At the present time the buildings are completed and a good portion of the fencing is in the process of being installed.

Based on input/output coefficients provided by project personnel, the facility may produce some rather expensive animals. Annex F compares the expected cost of the steers assuming both 240 and 480 animals per year are run through the facility. The costs are based on an expected weight gain of 35 kilos over the 12 month period the animals will be held on the ranch.

According to Annex F, at full capacity for the facility the steers will cost Togo 87,000 FCFA by the end of their first year on the ranch, as compared to under 50,000 FCFA for a steer of equal weight purchased from traders. Not counting the cost of lost production occurring because the facility land has been removed from use by traditional herders who produce animals without any investment on the part of the project, the animals will cost 85,000 FCFA. Even excluding all fixed costs financed by USAID and the cost of the original animals, the cost of caring for the animals will exceed 26,000 FCFA each when the ranch is at full production. This compares with the value of the additional meat put on each animal, calculated as 9,500 FCFA at current prices. These costs will not decline with a longer period of confinement using only grazing as a source of feed or by increasing the scale of operations since almost all of these costs are variable costs related only to the amount of time spent at the facility.

The costs in Annex F do include some of PROPTA's other costs relating to animal purchase and distribution. The animals should be in good health and will have received the necessary veterinary care when it comes time to sell them. On the other hand, transport costs will be higher since most of the animals will be destined for the southern regions. In all, the cost of a pair of oxen would have to increase by at least 30,000 FCFA over present prices for animals of equal weight in order for PROPTA to recover just its operating costs for the facility and by 60,000 FCFA to cover fixed costs as well. This compares with a premium of 20,000 FCFA that PROPTA now pays for a pair of equal weight purchased from the CREAT ranch when it needs to augment its supply of animals over what it obtains from the private sector. It is doubtful that PROPTA will be able to sell privately many animals with this kind of increase in price.

The focus of PROPTA on actions that will retard the rise in animal prices in the private sector appears to the evaluation team to be misplaced. In this case not only will the Namiele

facility increase costs per animal overall, it also will result in the transfer of a substantial portion of these costs from farmers to the state as PROPTA necessarily yields to pressure to contain the increase in its prices. It would be better to allow prices paid to herders to rise 10,000-15,000 FCFA per head and force up the general level of prices for traction animals. This would increase the supply from traditional sources by discouraging the large amount of slaughtering of steers for ritual and festive purposes, by drawing animals from neighboring countries with more abundant cattle resources, and more importantly, by encouraging livestock production by farmers in the areas where the animals are needed. In any event, a full financial analysis of the cost of operating the Namiele facility needs to be undertaken to determine its viability.

7.7.3 Private Sector

PROPTA does not appear to have taken any specific actions to expand the importance of the private sector in animal supply. Available data indicate that non-PROPTA sources supplied about 90% of all traction oxen before the project and still do. The tremendous majority of these animals are supplied directly to farmers by the private sector.

In areas where adoption of animal traction has reached or passed the take-off point, as in most of Kara and Savane regions, projects encourage farmers to arrange purchase of their animals directly from other farmers wherever possible. In the Kara region, PCA no longer purchases animals from PROPTA on a regular basis, though the FED-KARA project and SOTOCO still do. In the Savane region, most animals are purchased without any assistance from the agricultural services at all.

Although PROPTA cannot demonstrate a specific course of actions it has taken to promote the role of the private sector in supplying work animals, it is to PROPTA's credit that it has so far avoided a level of subsidy that prices the private sector out of the market. This is no small accomplishment in Africa. PROPTA has priced its animals about 30% above the price of comparable weight animals available directly from traders and producers. Although this is still not sufficient to cover all of PROPTA's costs, it provides an adequate incentive for farmers to seek their animals from private traders and producers when they can. PROPTA sees its role as a provider of last resort and it has been sticking to this role via its pricing policy in spite of some criticism. Whether it will be able to continue to do this once it is using the Namiele facility is an open question.

7.8 Animal Health

Animal health in the PROPTA component of project activity has been the subject of considerable effort, emphasizing the

role of prophylaxis and nutrition, and to a lesser extent, diagnosis and treatment. In this respect PROPTA has executed its mandate to coordinate support services to animal traction farmers with relative efficiency, if at the risk of providing parallel services to those which are in principle, if not always in practice, available from the official animal health service.

Project accomplishments and activities may be divided into three domains: training, coordination, and supply.

In an effort to assure that animal traction adopters are provided with reliable and comprehensive information in sustaining good animal health, the project has disseminated a series of valuable "fiches techniques" on the subject of dry and rainy-season nutrition. This information is consonant with cropping systems recommended by the project which, when implemented, assure the provision of adequate forage and supplementary feed during traditional periods of dry-season nutritional stress.

Similar "fiches techniques" have been produced in coordination with PCA to assist farmers and veterinary agents in the initial reporting and diagnosis of animal health problems.

In order to coordinate the sometimes redundant activities of individual regional projects, and to assure that working animals in the project zone have access to prophylactic care, the project has played a leading role in establishing a model consolidated treatment program.

Beginning in 1986, PROPTA organized a program of collective treatment sessions in the Savanes region, at more than sixty locations convenient to animal traction farmers. During two rounds of pre-announced treatment (April and October 1986, and May and October 1987) all traction animals presented were provided with a package of prophylaxis, including trypanosome and rinderpest vaccination, and internal and external deparasitization. This service was provided on a cash basis, with the "package" of treatment assessed at 1,400 Francs CFA. (In response to several epizootics, additional vaccination programs were coordinated by the project at no additional cost.)

The success of the prophylaxis program may be measured in the number of animals treated from year to year, both as an indicator of the effectiveness and acceptance of the program's value by farmers, and a measure of improved coordination among various regional agencies participating in the program (including the Animal Health Service, SOTOCO, DRDR, and several autonomous projects.)

April, 1986
2,576

October, 1986
2,996

May, 1987
4,337

October, 1987
3,586

Figures available from SOTOCO indicate that mortality among traction animals is not yet a serious problem. Among 1314 insured traction animals in 1985, the average mortality rate was 2.3%, with deaths due to disease and accident roughly equal. Regional distribution of mortality appears to be lowest in the Savanes region, increasing markedly the further one moves toward the coast, rising to 7% in the Maritime region.

These figures indicate that eventual Government of Togo programs to accelerate the transfer of animal traction technology southward must be attentive to the need for the type of coordinated program that has been promoted by PROPTA. Prophylaxis and treatment must be coordinated at the regional level and well-integrated with programming for adequate year-round animal nutrition.

Similar success has been registered by PROPTA's creation of a standardized animal health treatment record, sold to farmers at a cost of 200 Francs CFA. The form, sold by extension agents to animal traction farmers, assures provision of a permanent record of prophylaxis, illness and treatment and is more precise than records traditionally kept by local animal health service agents.

PROPTA's role in coordinating supply of veterinary pharmaceuticals and products is problematic. While the organization has effectively purchased an inventory of supplies for some 25 veterinary posts in project zones, this activity parallels the institutional role mandated for the veterinary service itself. While the FED revolving fund, subject to additional replenishments under a new funding agreement, will ensure that PROPTA can continue to provide this service, several serious problems must be addressed:

- PROPTA supplies are insufficient--and not intended--to meet global needs, and are selectively distributed only to those areas where the number of traction animals is highest and project interventions most concentrated.
- PROPTA activity provides a disincentive to the Animal Health Service to improve upon its own organizational and resource deficiencies;

- Inadequate inventory and order systems need to be established at the local level to optimize inputs from either PROPTA or the animal health service. This will prevent poor coordination, the overstocking of some veterinary posts, and negligence of others.

While the provision of 13 motorcycles to agents of the animal health service through PROPTA has relieved logistical bottlenecks over the short term, evidence suggests that this aspect of programming must be backed by policy changes within the service itself, as explained earlier in this report. Resources for the long-term transportation needs of veterinary agents remain unidentified and far from assured.

7.9 Monitoring and Evaluation

PROPTA's articles of organization assign monitoring and evaluation a first-place priority. So does the project paper. PROPTA's M&E unit was to monitor and evaluate the activities of animal traction projects in Togo by promoting the inclusion of M&E units in the various projects. It was also to evaluate the effectiveness of project activities and provide analysis and other feedback to policy makers so as to enable them to take corrective action. Both the GOT and the PP design team appreciated the importance of a properly functioning M&E unit to achieving the project's purpose.

The M&E unit at PROPTA is headed by an expatriate agricultural economist. During the four year period under his leadership the unit is developing and maintaining an extensive data base that is to include all animal traction owners in Togo. He estimates that the list is now about 90% complete. The list is used to help veterinary and extension agents program their vaccination and extension activities, estimate needs for equipment and spare parts and provide up-to-date statistics on the magnitude and location of animal traction activities in Togo.

Other activities of the PROPTA M&E unit have included: supervising Togo's University of Benin students conducting thesis research on topics of direct interest to the project; gathering data from DRDR field agents for conducting various studies of animal traction and the extension and veterinary services which must promote and sustain it within the country; gathering and publishing various statistics on animal supply, animal health services and the use of equipment by animal traction farmers; and various studies on economic and technical aspects of animal traction in Togo. In addition, the technician responsible for the M&E unit has been the driving force behind publication of a periodical that disseminates

information on animal traction to extension agents and the administrative and technical staff of the various projects. He has also provided substantial in-house training to PROPTA staff and has facilitated the development of training programs for farmers.

Given the vast array of things that needed to be done with respect to monitoring and evaluation, and the large gap between what PROPTA is expected to do and the resources put at its disposal, it should not be surprising that the evaluation team would find gaps in the work of the M&E unit. It does, however, seem clear that USAID recognized some of these gaps and tried to correct them.

During the latter part of 1986 two consultants reviewed the project's monitoring and evaluation system and suggested improvements. Unfortunately for the project, the second of those consultants focussed almost exclusively on the kinds of impact measures USAID uses for the preparation of semi-annual PIR's. He neglected measures of the operating effectiveness of the various technology adaptation and delivery systems. This meant that PROPTA, and the PCA monitoring activities which the PROPTA M&E unit was to guide, continued to neglect gathering some information needed to provide project directors and the GOT with the feedback they needed to maximize the effectiveness of project activities.

To some extent the technical assistance team is correct when they point out that they could not have done much more even if they wanted to. The project agreement failed to provide sufficient resources for a field staff that could monitor field level operations in the way the evaluation team believes is necessary. But there were, however, a number of useful monitoring indicators that could have been gathered without requiring a separate field staff. These include: regular and timely reports from the CATs on their supply of spare parts; from the agronomist on the quality of the research and demonstration plots on the CATs and on farmers fields; from the extension agents on the condition of the animals, the presence of sores or other problems indicating poor equipment, and the suitability of equipment for the various farm operations; from Model Farmers on problems they face in using their equipment; from the accountant on the time period between the time an order is placed and the time it is filled; and, from PCVs and sector chiefs on problems they are facing in their sectors. For some indicators it would be necessary to train the observer in just what to look for. But others could come from the problems section of a brief monthly report, perhaps using a largely precoded sheet that would permit easy computer entry and analysis. The important thing is that it be done, that the results be made quickly available to project directors and others concerned with project management, and that project management do something to correct the problems.

8.0 ECONOMIC ANALYSIS

8.1 Financial and Economic Returns

As the analysis in Annex G points out, on the basis of crop costs and returns alone, animal traction produces net income per hectare that is about 39% greater than manual cultivation in both financial and economic terms. The return per manday is around 680 FCFA with animal traction as compared to 490 FCFA for the traditional system. When all costs associated with animal traction are included, however, the differences are less dramatic, with a financial internal rate of return of 13% without credit against almost 15% with it. Though acceptable, these rates are marginal in relation to a farmer's other alternatives and are not high enough to explain the strong demand for animal traction units in the project area.

Looking at certain key assumptions that might explain this divergence between apparent financial returns and farmer behavior, a 30% increase in area cultivated versus the 19% used in the budget, farmer perceptions of needing to repay only 75% of their loans, and reducing care and maintenance for animals to one-half hour per day all increase the IRR substantially. If farmers attach no cost to the time spent caring for animals, because having animals is an element of prestige, then the returns get interesting, rising to nearly 25% with credit. If certain of the more likely changes in assumptions are combined, then returns rise above 20% on a cash basis and almost 30% with credit. These rates begin to explain what one observes occurring daily in the project area.

In all likelihood, each of these factors operates in different circumstances and cause certain farmers to obtain the high returns necessary to undertake animal traction. As animal traction spreads and spare parts and animal traction extension services become more widely available, the risk associated with the use of animal power declines and new adopters settle for lower returns than did early adopters. What is happening in the field indicates that farmers find animal traction profitable, and not just because of credit that is perceived as not having to be repaid.

The economic returns do not appear as promising. Lower prices for cotton and maize would reduce the IRR using the representative set of assumptions to 10%. Still, with the very high prestige associated with oxen many farmers would continue to find animal traction very attractive.

There is no such thing as the rate of return to animal traction. Every farmer experiences a different rate. Even when an investment is marginal on average, half of all adopters

experience above average returns. This explains much of what is going on with respect to animal traction in Togo at the present time. By improving training, availability of spare parts and animal health services the project is helping farmers to realize more of the inherent potential of animal traction in the country. What they are able to earn from their investment is clearly considerably higher than what it would have been without the project.

8.2 Comparison With the Project Paper

The increase in net returns at the farm level appear to be about two-thirds of the amount anticipated in the project paper. The present value of the incremental total income obtained from an animal traction unit purchased on credit is scarcely positive in economic terms according to the evaluation team's analysis. This compares to over \$2,500 estimated in the project paper. The difference arises partly from the design team's assumption that non-labor input costs account for only 20% of crop revenue as opposed to the 25-33% found by the evaluation team. It arises from assuming that area would increase by 30% rather than 20% and yields by 30% as opposed to 5-25%. Including mortality and the cost of caring for and feeding the oxen in the evaluation team's analysis further depresses the amount of net income remaining after deducting costs.

8.3 Secondary Benefits

In the area of secondary benefits the project will probably exceed the effect expected in the project paper, at least with respect to the spread of the technology. The momentum of project activities suggests that it is reasonable to expect that 200 more farmers per year will learn how to use animal traction properly than would have occurred without the project. The design team assumed this would occur for only two years, followed by 100 per year for another five years. The final number will certainly be much greater. The difference is in the estimate of the value of this increase. With a low net economic benefit from adoption estimated by the evaluation team, the large numbers of adopters do not have an appreciable impact on project returns.

Much the same can be said for the PROPTA component. The number of farmers affected and adopting the technology will exceed design team estimates. But the economic benefit of such adoption will be lower.

8.4 Conclusion

This analysis suggests that animal traction, though profitable for many farmers in financial terms, is more marginal in economic terms. The analysis, however, is not

convincing. It suffers from a lack of hard quantitative data on key costs and benefits of animal traction. It can only explain the current rapid rate of adoption of animal traction in terms of reducing drudgery or ignoring the costs of caring for animals because of the prestige of having a pair of oxen. These are weak arguments. It does not seem likely, on the basis of the evidence in Togo, that the evaluation team's analysis underestimates the expansion in area or the increase in yields associated with the use of animal traction. Rather, a more likely explanation of the divergence between the results of this analysis and the level of farmer interest in the field is that the input/output data overestimate labor and other inputs associated with animal traction. In this case the returns would be higher than indicated here.

9.0 IMPACT OF USAID WITHDRAWAL

9.1 Impact on Operating Resources of the DRDR and the Veterinary Service

The impact of project termination for the DRDR and the veterinary service must be measured on several bases:

Programming instituted during the life of the animal traction project is likely to be sustained. The emphasis of Togolese policy and the terms of the nation's Structural Adjustment Loan III indicate that institutional mechanisms will be sustained, if not reinforced, over the short to medium-term.

Some danger exists that while the emphasis of SAL III and La Nouvelle Strategie on agricultural training will extend lessons learned under the project, programming for the animal health service may not keep pace with the animal traction component of DRDR activities. PROPTA advocacy of adequate political and programming support for the animal health service could be critical during this period.

Technical assistance withdrawal is unlikely to affect either of the above institutions seriously. Programming instituted and tested under the animal traction project is well-articulated and sustainable given appropriate backing by the DRDR, the animal health service, and PROPTA. Extensive new technical assistance under World Bank, FED, and other upcoming programs will be satisfactory at the level of regional programming, although not precisely homologous with that provided by the project. The greatest evident risk--and one that is difficult to predict--is that the role of the technical assistance team as a binding force for multi-institutional coordination may not be supplanted by counterparts in the post-project era.

Financial and logistical support for the DRDR and the animal health service must be addressed separately. Resources committed to the former are assured under SAL III, although programming may not be exactly homologous. New resources and concomitant institutional roles will vary somewhat, but assure overall support and enhancement of the existing hierarchy of DRDR institutions and field-level interventions.

The evaluation team has thus far been unable to identify specific resources earmarked under SAL III, FED or other project financing for the animal health service. However the recent reorganization of the service under the Ministry of Rural Development could result in the rationalization of resources and programming over the medium to long-term.

Because the great majority of project funding was consumed by technical assistance, contractor overhead, and operating costs of the project itself, the principal and most immediate impact of project termination may be on the PCA motor pool. Vehicles which are not reassigned or replaced by the DRDR and animal health service are certain to suffer from the lack of adequate maintenance funding.

9.2 Impact on PROPTA

Financial support for PROPTA, in the final year of project activity, is divided as follows:

PROPTA Budgetary Resources by Source 1988-1989
(FCFA)

	GOT	FED	USAID	USAID As Percent of Total
	-----	-----	-----	-----
Recurrent Costs:				
Personnel	25,362,840	--	--	0%
Operations	7,650,000	16,253,648	53,489,000	69%
Contingency	--	5,609,964	10,000,000	64%
Capital Costs:				
Construction	18,000,000	--	32,700,000	64%
Equipment	--	16,422,000	18,370,000	52%

While nominally and ostensibly a "project," PROPTA has established itself as an ongoing institution, with responsibilities and programs of indefinite duration. Resources available to PROPTA from the Government of Togo, the FED revolving fund, and new FED project commitments indicate that the termination of US technical and financial assistance will have its greatest effects on the thrust of organizational programming.

While USAID has provided technical assistance to PROPTA in the form of an economist/monitoring & evaluation specialist and an animal scientist, it has made no contributions to the organization's personnel budget. While competent, existing staff exists at PROPTA to continue the work of the animal scientist, the same cannot be said for the economist. The absence of a qualified counterpart to the TA economist, and the failure of the project to assure adequate participant training indicate that monitoring and evaluation capabilities may not be sustained.

A major reduction in USAID support to recurrent operational costs will also impact on programming. AID

contributions have funded discrete activities for which no alternative resources have yet been identified. New technical assistance agreements with, and funding from FED may enable PROPTA to program elements begun under the project, this is far from assured.

Under the new FED agreement operating funds for PROPTA between 1988-1992 will include 78.5 million Francs CFA for vehicle maintenance and operation; 38.5 million Francs for new vehicle purchases; 20.4 million Francs CFA for office and technical materials. An additional 16 million Francs CFA will be spent in support of research on the use of cows in animal traction, and mono-boeuf technology.

Major investment/capital costs and contingency funds were funded by the project for clearly-defined and fully implemented construction program in support of project activity, and for the purchase of vehicles for a motor fleet either utilized or supervised by PROPTA. Disbursement of these funds has satisfied the terms of the USAID commitment to PROPTA and left the organization with infrastructural resources well-suited to future activities.

Optimal utilization and maintenance of vehicles and structures funded by the project is not a certainty, however. This will depend largely on two factors: GOT funding for future PROPTA activities, and cost recovery in the implementation of PROPTA equipment and livestock sales. As explained elsewhere in this report, net subsidies exist in the PROPTA livestock sales program, which might not be sustainable over the long-term. As operational costs mount when the Namiele holding center becomes operational, this could prove to be a drain on PROPTA resources, resulting in less attention to site and vehicle maintenance, and funding cutbacks in unrelated programming.

9.3 Impact On Animal Supply

In areas to the south, where farmers do not have a tradition of caring for animals or where the supply is scarcely sufficient for ceremonial needs, some outside assistance, both for training farmers and extension agents and for acquiring oxen is still needed. Such assistance will continue to be needed until the number of pairs of animals approaches 1,000. If not PROPTA, then a project or some other intervention agency will be needed to reduce the risks of identifying and acquiring suitable animals. Otherwise costs and risks will be high and expansion will be slow.

9.4 Impact in Animal Traction Extension

The USAID project sought to strengthen government systems which can furnish the extension services, needed as growing numbers of farmers introduce and adapt animal traction technology.

The GOT's identification of food production as a national priority and its endorsement of animal traction as an appropriate production means is a good general indicator that support systems will be maintained. The initial success of the training and visit system and incorporation of animal traction themes into it gives further hope that AID's efforts will be multiplied.

An immediate and serious effect of AID's withdrawal, however, will be the loss of personnel responsible for training program development.

Training programs and related written materials generated by PCA solve many of the training problems that existed at the time of the Project Paper, and which are cited therein. In the estimation of the evaluation team--who saw them used in the field on five occasions--they are invaluable 'go-ahead' resources for new and existing projects, country-wide. Fine tuning of these programs will maximize their benefits. The creation of additional programs will equip the DRDRs and PROPTA with training tools needed to improve problems areas such as animal health, animal training, forage production, manure use, yoke design, etc.

It does not appear that either PCA or PROPTA will attempt to further develop the training package once the TA team leaves. The PCA counterpart to the agronomist who developed the program has only modest qualifications in the area of training design. Furthermore, PCA lacks a computer and cannot practically use PROPTA's--a deterrent to fine-tuning or expanding the materials that were written on the agronomist's own computer. PROPTA, in the meantime, is going ahead and developing training programs for the central and southern regions and formatting them in a completely different way. The overall result that an excellent opportunity is being missed--that is, the establishment of a central file of standard format training components that can be easily accessed, upgraded and packaged to meet the needs of various farming systems in Togo. (See PROPTA, section 7.3).

In this context, the evaluation team recommends that the contract of the TA agronomist be extended for six months.

9.5 Impact of USAID Withdrawal on Spread of Animal Traction

It is a "fait accompli" that animal traction will spread in Togo with or without projects designed to promote it. One has only to visit the villages along the country's northern borders to see widespread use of Ghanaian ridgers, to find Burkina-forged plows and spare parts in marketplaces, and to see donkey traction used for transport. Animal traction is popular because it is an affordable alternative to farming by hand.

But all too often, poor designs and practices are passed along by example, or farmers learn by trial and error--unaware of proven techniques. In order to realize the full benefits of animal traction, farmers need access to appropriate tools and training, and they need to develop farming systems that employ many animal powered operations instead of only one or two.

Nine hundred Togolese farmers began using animal traction as a direct result of the AID project. Clearly, the project's approach to animal traction promotion was qualitative rather than quantitative. Each new farmer received 170 hours of initial training and 10-25 hours of follow up training each year afterward, depending on need and interest. All of Togo's 7,000-plus animal traction farmers now have access to extension services that have been strengthened or expanded by the project.

The USAID animal traction project was designed on the principle that a well-trained nucleus of farmers with access to credit, good equipment, veterinary and artisanal support would demonstrate the practicality of the technology and lay a foundation for much broader acceptance. Given this strategy, it is evident that the success of the project will not be seen in numbers of adopters, but in the number of adopters who realize the full benefits of animal traction--and whose success is multiplied by those who follow.

10.0 RESTRUCTURING PROPTA

PROPTA's principal mandate--to coordinate the promotion and extension of animal traction technology--is a valuable one. However the large number of specific functions assigned to, or assumed by, the organization is troubling. Accretion of responsibilities for livestock supply, equipment distribution, and technical coordination threatens to dilute the organization's ability to perform any single function in a timely and cost-effective manner.

This phenomenon is already evident at the level of monitoring and evaluation. Inadequate host-country counterpart personnel, inadequate provisions for participant training, and inadequate data processing capabilities at PROPTA have continued throughout the life of the project, threatening the viability of PROPTA M&E programming once technical assistance is withdrawn.

Similarly, and oversights in animal traction technology at the level of PROPTA and cooperating institutions indicates that insufficient emphasis has been placed upon technological diagnostics--a critical function which PROPTA is ideally suited to perform. While the institution must be commended for its innovative efforts in the advocacy of animal traction technology, the technical content of materials distributed by PROPTA--in the form of fiches techniques, equipment design, and the publication, FORCE ANIMALE--must be tested and diagnosed more thoroughly.

Institutional resources have instead been devoted to livestock and equipment supply operations, shifting the emphasis of PROPTA activity to essentially clerical and accounting functions. Analysis of PROPTA performance in those areas and projections for their viability that are contained elsewhere in this report indicate that PROPTA may not be able to provide these services efficiently or without effective subsidies which are unsustainable over the long term. While PROPTA's role in these areas is well-intended, evidence indicates that PROPTA supply operations may, in fact, add administrative complexity to functions which other institutions are better-placed to perform.

Even if it is acknowledged that PROPTA has a role to play in the coordination of animal and equipment supply, institutional programming should be based upon a timely transfer of these functions to other institutions. At present, no such timetable exists and institutional resources appear to be geared toward performing these functions in perpetuity.

PROPTA institutional structures are appropriate to the organization's mandate. Programming and resource distribution are not.

While provisions exist for diagnostic follow-on activities under new FED financing and technical assistance, technical programming over the medium-term will be highly circumscribed, limited to experimentation in the use of cows and mono-boeuf technology.

Remedial and diagnostic programming of an on-going nature must be included within PROPTA activities on a larger scale than currently exists in order to assure that the lessons of the past are optimized.

11.0 CONCLUSIONS AND RECOMMENDATIONS

11.1 Policy and Institutional Framework

Although it is realized that the Project is coming to an end, the evaluators provide the following recommendations for consideration.

11.1.1 End-of-project reporting and recommendations by the TA team should be framed with explicit reference to organizational structures and programs under La Nouvelle Strategie du Developpement Rural. Both USAID and the TA team should identify TAT program elements that fit within new World Bank and FED project activity.

11.2 Resource Management

11.2.1 USAID Togo should carry out an internal review of project management procedures in order to clearly identify systemic problems that block resource availability to projects.

11.2.2 USAID, GOT and REDSO should work together to simplify procedures for cash advances and disbursement so that administrative complexity is not itself an impediment to project success.

11.2.3 Annual budget requests submitted by projects should be accompanied by detailed work plans for the budget period, indicating how resource use fits within programming. This would expedite budgetary reviews by USAID project managers and curtail the frequent delays which occur when line-item requests appear unsubstantiated or inappropriate to project activity.

11.2.4 At the project level, USAID should encourage greater attention to the process of budget-formulation. Budgets should be based upon programming needs, not upon perceived resource availability.

11.2.5 USAID should institute annual or semi-annual resource management and administrative workshops for TA and counterpart project administrators. Workshops should include half-day elements on administrative procedure and case-study materials--an abundance of which have been generated by the Togo Animal Traction Project alone! Excellent curricula for this kind of programming have already been developed by the Sahel Regional Financial Management Project.

11.2.6 A viable alternative to current administrative practice, and which merits development, would be to broaden the terms of reference for technical assistance contractors to include resource management at the project level. Statutory

accountability of USAID would not be diminished so long as adequate guidelines were drafted for cash management, and so long as periodic reviews by USAID project management were made mandatory.

11.3 Animal Health

11.3.1 USAID should explore, encourage and support efforts to establish a program for operational and policy reforms within the animal health service. Among the areas to be addressed would be: rationalization of costs and pricing formulae for services and supplies; cost recovery for transportation of agents; resource distribution at the national and regional level; development of structures and programs to enhance the quality of care available to injured or sick animals.

11.3.2 USAID should take a lead in stimulating efforts by PROPTA, the DRDR, and the animal health service to better structure complementary services. Protocols governing veterinary supply and distribution must be rationalized and coordinated to ensure equitable provision of supplies to veterinary field stations, CAT centers, and animal traction projects.

11.3.3 USAID should encourage the animal health service to disburse travel indemnities in a timely and equitable fashion to all agents and their assistants, whether or not they are provided with official means of transportation. It should explore and support the creation of sector-level buffer accounts which, operating as revolving funds, would assure the availability of operating resources to the animal health service on an on-going basis. Replenishments to the fund could come from annual GOT budgetary contributions or through charges to animal health service clients.

11.3.4 Because the thrust of animal health service activity is in the areas of prophylaxis and meat inspection, care for sick animals is not widely available. USAID should encourage PROPTA and the animal health service to formulate a program of training for village-level para-veterinarians. The program should cover basic elements of diagnosis, animal first aid, and the treatment of minor injuries. Trained para-veterinaries could operate at the village level on a cash or barter basis, requiring no salaries or subsidies.

This program would address an identified need, and would complement existing services that are available only on a limited basis from existing institutions.

11.4 Participant Training

11.4.1 USAID should require projects to draw up participant training schedules and programs during the first year of implementation. This would allow adequate time for the identification of appropriate training programs and institutions, training, and re-insertion of host-country personnel during the life of projects.

As in the case of budgeting, participant training schedules must be based upon identified institutional and programming needs, and not on the presumed availability of funding.

11.4.2 USAID policy to encourage third-country (non-US) training is a good one, and should be continued. Existent training resources in Togo and elsewhere in the region are sometimes excellent, generally cost-effective, and suited to participant training needs. This is especially true of a number of regional agricultural training and research institutions.

11.4.3 Undisbursed TAT participant training funds should be disbursed under the newly-extended PACD. Available funds should be utilized for training mid-level DRDR (PCA) and PROPTA personnel in: monitoring & evaluation; credit program management; animal traction technology.

In order to maximize the impact of training late in the life of the project, USAID should consider utilizing undisbursed TA/TDY funds to organize appropriate training sessions in Togo.

11.4.4 USAID should encourage and support an expanded program of blacksmith training in the Savanes region, specifically oriented around the repair of animal traction equipment.

11.5 Extension and Training

11.5.1 Extension of the contract of the PCA/PROPTA TA agronomist for a period of six months is recommended. This would serve the purpose of developing PCA-type training programs for PROPTA and standardizing training methodology.

Programs designed by him should reflect the needs of farmer and agent training/retraining in all regions where animal traction activity is being promoted (Thematic material of the type to be developed is included in the annex: "Training Program").

11.5.2 CAT center operations should be continued under the direction of regional DRDRs, and within programming of the World Bank-funded national extension services project.

11.5.3 The value of Peace Corps' role in animal traction is well-established and should be continued as part of support to the DRDRs. USAID should explore the possibility of utilizing undisbursed TAT funds to assist this vital element of animal traction programming.

11.6 Input and Equipment Supply

11.6.1 USAID should support an end-of-project effort to establish standardized inventory management methods at the level of PROPTA, UPROMA, CAT centers, and animal traction projects.

11.6.2 USAID should explore avenues of assistance to UPROMA in establishing a private-sector network of animal traction equipment distribution. Such assistance should include establishment of a revolving credit fund for village-level distributors and retailers, and start-up capital for mobile inventory agents.

11.7 Credit

11.7.1 USAID should encourage or fund technical assistance to this vital area of animal traction programming. Terms of reference for such an intervention would include the elements described below.

11.7.3 Establishment of a better monitoring system of the results of credit administration on a monthly basis, and for reporting these results to senior credit or project managers.

11.7.4 Review of government policies that warrant leniency with respect to deficient loan payments and appropriate follow-up actions. Effective and workable

guidelines should be clearly established for imposition of sanctions against those who default on loans.

11.7.5 Periodic reviews of individual farmer portfolios should be continued in order to decide on appropriate collection actions or late-payment sanctions.

11.7.6 Better control documentation should be established to identify late payments and factors which contribute to them on a global and individual farmer basis.

11.7.7 Projects utilizing the credit resources of the CNCA or donors must establish, from their outset, exacting guidelines which formally assign credit administration, management, and collection responsibilities to named individuals.

11.7.8 Future project design should re-evaluate the role of the CNCA as the administrator of last resort for the collection of overdue loans or reposessor of animals and equipment.

11.8 Animal Supply

11.8.1 No further USAID funds should be expended for construction of the Namiele livestock supply facility until an adequate financial analysis of proposed animal supply operations is expected.

11.9 PROPTA

11.9.1 PROPTA programming needs to be more attentive to the basic elements of animal traction technology, with emphasis on research, project support and coordination. PROPTA's Managerial responsibilities for equipment and livestock supply should be appraised with the aim of reducing PROPTA's role in this area, if appropriate.

11.9.2 The transfer of equipment supply responsibilities from PROPTA to UPRONA and the private sector should be explored and scheduled, mobilizing technical assistance available from UNIDO and other sources.

11.9.3 A five to seven-year schedule should be established for the gradual withdrawal of PROPTA from animal supply activities.

11.9.4 It is imperative that PROPTA be able to fine-tune its information and training materials over time...in a timely, efficient and professional manner. FORCE ANIMALE, fiches techniques, and all training curricula should be

formatted on a computer for easy reference, revision, and publication. A standard desktop publishing system or software for the existing system should be considered along with appropriate training for PROPTA clerical personnel.

11.9.5 PROPTA should further explore avenues of assistance and cooperation available from the government-operated radio and television networks: powerful media with evident programming needs. PROPTA is well-placed to coordinate--but not to produce--informative and interesting programming on animal traction and agricultural development.

11.10 Monitoring and Evaluation

11.10.1 USAID should explore avenues of further technical assistance to strengthen the Project's monitoring and evaluation efforts.

11.10.2 PROPTA remains the ideal location for animal traction M&E activity, and should be supported in its efforts.

11.10.3 A simpler system of M&E should be established at PROPTA to focus on the following areas: credit administration and repayment rates in animal traction projects; the frequency and impact of extension activity on animal traction adopters; regional, sector, and sub-sector responses to extension and technology transfer programming; equipment and animal supply and availability; farmer adoption rates of individual aspects of animal traction technology; productivity responses to cropping packages combined with animal traction technology.

TOGO ANIMAL TRACTION DEVELOPMENT PROJECT

(A.I.D. NO. 693-0218)

FINAL EVALUATION REPORT

ANNEXES

PROJET CULTURE ATTELEE D.R.D.R.
REGIONS DE LA KARA ET DES SAVANES

Le Programme de Suivi des Praticants de Culture Attelée Gérer par les Maitre-Dresseurs,
les Chefs Sous-secteurs et les Encadreurs.

Visite 1: Connaissance du Paysan Evaluation de son Systeme Cultural

Quand effectuer la visite? La visite aura lieu lorsque le maitre-dresseur aura lu et
compris le programme de travail afin de l'expliquer aux
paysans de culture attelée de la zone.

Travail à faire au cours de la visite 1:

1. Expliquer au paysan le but des visites.
2. Remplir LA FICHE HISTORIQUE afin d'enregistrer l'historique de chaque paysan.
3. Informer les paysans du calendrier des traitements collectifs dans la zone.
4. Noter sur la Fiche de Commande les différentes pièces dont la paysan a besoin.
5. Demander si des paysans voudraient emprunter le semoir rotatif? Si oui, marquer sur la fiche de semoir rotatif.
6. Mener L'EVALUATION DU SYSTEME CULTURAL avec chaque paysan. S'assurer que chaque paysan comprend l'importance des différentes questions. Discuter avec chaque paysan des différentes défauts que vous remarquez dans son système.

Visite 2: Préparation du Sol.

Quand effectuer la visite? Cette visite se fera lorsque le paysan prépare son champ
à l'aide de ses animaux.

Travail à faire au cours de la visite 2:

1. Noter sur la Fiche de Commande les différentes pièces détachées dont la paysan a besoin.
2. Encourager le paysan à avoir au moins 0,25 ha pour le sarclage mécanique avec ses animaux.
3. Si le CAT a un pulvérisateur qui fonctionne bien, déterminer les paysans qui veulent un déparasitage externe de leurs animaux.
4. Pendant que la paire travaille, le maitre-dresseur devra aider chaque paysan qui a des problèmes de réglage de son équipement, des problèmes en travaillent avec ses animaux, en installant son champ pour le sarclage mécanique, etc. Lorsqu'on est satisfait et sûr que le paysan travaille correctement avec ses animaux, remplir la fiche PREPARATION DU SOL pendant qu'il travaille avec sa paire. A la fin du travail, mener une discussion sur les résultats de l'évaluation avec chaque paysan.

Visite 3: Sarclage Mécanique

Quand effectuer la visite 3? La visite aura lieu au moment où le paysan veut faire le sarclage mécanique de l'une de ses cultures. Cela ne doit pas être le premier sarclage mécanique. Il faut s'assurer que le paysan ne va pas attendre la venue du maître-dresseur ou responsable avant de faire le sarclage mécanique.

Travail à faire au cours de la visite 3:

1. Le maître dresseur devra travailler avec chaque paysan et s'assurer que chaque pratiquant sait régler son matériel de sarclage. Quand vous constatez que le paysan sarcle correctement, remplissez la fiche d'évaluation LE SARCLAGE MECANIQUE. Ensuite vous discutez des résultats d'évaluation avec chaque paysan.
2. Informer les paysans du calendrier des traitements collectifs dans la zone.

Visite 4: La Préparation pour la Récolte

Quand effectuer la visite 4? La visite 4 doit avoir lieu en Août ou Septembre ainsi la récolte des fourrages et sous-produits peut être entreprise.

Travail à faire au cours de la visite 4:

1. Si le paysan a planté du pois d'angole, lui expliquer comment faire la récolte pour avoir un foin de qualité pour ses animaux.
2. Voir quelles cultures le paysan a fait et dont les sous-produits seront récoltés et utilisés comme litière ou aliments complémentaires.
3. Expliquez au paysan la façon de conserver ses sous-produits contre le soleil et la pluie.
4. Remplissez la fiche d'évaluation LA PREPARATION POUR LA RECOLTE avec chaque paysan. En discussion avec le paysan soyez sûr qu'il est capable de récolter et stocker ses fourrages et sous-produits pour servir les besoins de ses animaux.

LE SARCLAGE MECANIQUE

Visite: 3

Notation: 0 = Oui 1 = nul 4 = bien
 N = Non 2 = médiocre 5 = excellent
 3 = assez bien

Vu et Approuvé
 Le Chef de Secteur: _____

Maitre-Dresseur ou Responsable: _____

Notation des Paysans

Les Questions a Poser:

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
A. A-t-il semé en lignes droites et bien espacées? (1 - 5)										
B. Etat d'enherbement? (peu = 1 - beaucoup = 5)										
C. Le paysan a-t-il fait le sarclage très tôt pour que les herbes soient détruites par l'appareil de sarclage? (1 - 5)										
D. Est-ce que le paysan utilise la paire (P) ou le mono-boeuf (M)?										
E. Si c'est le sarclage à plat, indiquez le type de matériel utilisé: (1 - 5) La houe triangle avec 5 soc patte d'oie = 1 La houe triangle avec 3 soc patte d'oie et 2 demi-socs patte d'oie = 2 La houe triangle avec 3 soc patte d'oie et deux pics fouilleurs = 3 La houe triangle avec 3 soc patte d'oie = 4 La houe triangle avec 1 soc patte d'oie et 2 demi-socs patte d'oie = 5										
F. Le paysan sait-il régler le triangle pour la profondeur et la largeur de sarclage? (1 - 5)										
G. Les socs patte d'oie sont-ils tranchants? (1 - 5)										
H. Si c'est le sarclage sur billons, indiquez le type de matériel utilisé: (1 - 2) Le corps butteur aux ailes de 20 cm. pour les billons de 60 cm. = 1. Le corps butteur aux ailes de 25 cm. pour les billons de 70 cm. = 2										
I. Les ailes de sarclage sont-elles tranchantes? (1 - 5)										
J. Les ailes de sarclage sont-elles réglées pour enlever les herbes sur le flanc des billons? (1 - 5)										
K. Il faut combien de personnes sur l'attelage?										
L. Dégâts causés aux plants? (1 = peu, 5 = beaucoup)										
M. Est-ce que le sarclage mécanique est efficace? (1 - 5)										
N. Est-ce que le paysan fait un sarclage à la main sur la ligne aussitôt après le sarclage mécanique? (1 - 5)										
O. Notez la date de la visite chez chaque paysan (jour/mois) :										

95

PROJET CULTURE ATTELEE GUIDE DES TRAVAUX au cours de la Formation des Encadreurs et Chefs sous-secteur

Le Projet Culture Attelée organise les sessions de formation à l'intention des encadreurs et chef sous-secteurs sur divers thèmes relatifs aux techniques de culture attelée. Ces formations qui se tiennent dans les différents Centres d'Appui Technique permettent aux encadreurs et chefs sous-secteurs de recevoir une formation théorique et pratique. Alors ces agents d'encadrement pourront aider les pratiquants de culture attelée dans les différents travaux culturels avec les boeufs.

Ansî la section agronomie a dressé une liste non exhaustive de questions guides pour tous les intervenants. Elle compte sur le bon sens et le travail bien fait de ceux qui dispensent les thèmes pour une réussite de cette formation. Les intervenants doivent regarder les suggestions sur chaque thème avant de le présenter et il doit s'assurer que ces questions peuvent conduire à une discussion qui a trait à une information pratique. Chaque intervenant devra étendre selon ses connaissances personnelles et ressources intellectuelles la présentation de ces thèmes.

JOUR 1

MATIN

PRATIQUE / JOUR 1, 2

ACCOUSTOMANCE AU JOUG

- a. Prise de l'animal à la corde parmi tant d'autres.
- b. Technique de contention de l'animal pour le jouage.
- c. Technique de jouage des animaux de trait.
- d. Technique de museler les animaux de trait et rôle de la muselière.
- e. Techniques d'approcher et méthode pour rendre docile l'animal.
 - Lui donner un nom.
 - Lui donner des caresses.
 - Lui donner des aliments plus appétants qu'il recherche (sel, graines de coton, de maïs, sorgho, etc..)
 - Etre en permanence avec l'animal sous le joug.

THEME 1. Importance de la Culture Attelée (Avantages et Responsabilités)

Invitez les encadreurs à contribuer à la liste suivante: Apres avoir donné un avantage, que l'encadreur cite le matériel nécessaire utilisant cet avantage et les exigences de la formation pour tous l'homme et l'animal. Discuter le rôle des encadreurs dans leur tâche d'aider les paysans à gagner de ces avantages par l'emploi de la traction animale.

Avantages de l'emploi de la traction animale.

Matériels nécessaires.

Formation exigée par l'homme et l'animal.

- Quelle superficie le paysan peut-il exploiter avec une chaîne d'attelage au cours d'une campagne agricole?
- Quel temps une paire peut-elle travailler pendant une journée pour qu'elle soit rentable?
- Quel sont les moments de repos d'une paire au cours d'une campagne?

THEME 21. Les entretiens des cultures avec les boeufs.

Discutez les questions suivantes:

- A quel moment devra-t-on commencer le 1^{er} sarclage avec les boeufs?
- Peut-on faire le buttage avec les boeufs? Si oui, à quel stade végétatif?
- Combien de personnes faut-il pour le sarclage avec les boeufs?
- Quels sont les règles importantes à suivre pour que le sarclage avec les boeufs est efficace?

SOIR

THEME 22. Rôle du mono-boeuf et son exigence.

Discutez les questions suivantes:

- Pourquoi-a-t-on institué le mono-boeuf dans le système d'exploitation avec la culture attelée?
- Comment faire le dressage du mono-boeuf?

Comparer le travail du mono-boeuf et celui de la paire du point de vue rendement, facilité, temps et qualité de travail.

JOUR 8

MATIN

THEME 23. Les accidents de travail (homme et animal).

Demandez aux encadreurs de dire l'expérience qu'ils ont vécu dans le cas des accidents qu'ont eu les animaux et les hommes en matière de traction animale. Quelles sont les étapes de prévention de ces accidents?

Au tableau : Dressez une liste des moyens de prévention des accidents de travail en traction animale : Exemple: se rassurer que le joug s'adapte à l'animal correctement et ne va pas frotter contre l'animal. → joug

Au tableau : Aussi, avec l'aide des encadreurs établir une liste de produits locaux et moins chers qu'un paysan peut utiliser pour traiter les blessures et les plaies des animaux de trait.

SOIR

Evaluation Générale.

JOUR 9

MATIN

PRATIQUE / JOUR 9

DELIMITATION D'UN CHAMP POUR LE SARCLAGE MECANIQUE

- a. Délimitation du champ avant le labour (le plus long les lignes, le mieux).
- b. Délimitation du champ après le labour (à 2m du bord du champ et aux extrémités des lignes de semis).

PRATIQUE / JOUR 9, 10

SARCLAGE MECANIQUE AVEC LE TRIANGLE ET LES AILES DE SARCLAGE

- a. Montage et réglage des dents de sarclage sur le triangle.
- b. Montrez les dents qui peuvent être utilisées dans le sarclage des différentes cultures et des différents écartements.
- c. Attelage de la charrue.
- d. Montage des ailes de sarclage et leur réglage suivant l'écartement

entre billons.

e. Essai de sarclage sur billons.

THEME 24. Les différentes façons de préparer le sol (techniques de conservation du sol).

Discutez les questions suivantes:

- Pourquoi doit-on conserver nos sols?
- Quelles sont les différentes techniques de conservation de sol qu'un praticant de la culture attelée peut employer?

THEME 25. Les cultures en couloirs (but et entretien).

Visitez le champ de maïs et de pois d'Angole installé au CAT. Posez les questions suivantes:

- Qu'est ce que c'est que la culture en couloir?
- Quel rôle joue la culture en couloir dans la maintenance de la fertilité du sol?
- Comment devrait être menagé le pois d'angole dans la maintenance de la productivité du sol?
- Quelles autres cultures peuvent être cultivées avec le pois d'angole?
- A quelle période de l'année le pois d'angole devra-t-il être coupé?
- Qu'est ce qu'on fera du pois d'angole coupé pendant la saison des pluies? Pendant la récolte?
- Quels sont les problèmes qu'un paysan a lorsqu'il essaie de produire les semences de pois d'angole?
- Combien d'années le pois d'angole devra-t-il être maintenu en association?

Si le centre de formation a un champ de culture en couloir avec le leuceana, visitez l'installation. Si on n'a pas de champ de culture en couloir avec le leuceana, visitez la banque de fourrage. Discutez les questions suivantes:

- Pourquoi le leuceana est-il important pour les animaux de trait?
- Pourquoi le leuceana s'établit-il difficilement?
- Combien d'années faut-il pour que les plantes de leuceana produisent assez de fourrage?

Au tableau: Dessinez une banque de fourrage de 100 plants de leuceana. Indiquez la distance entre les plants. Dessinez aussi la clôture vivante composée de pois d'angole autour de la banque de fourrage.

Expliquez comment un paysan avec 500 graines de leuceana, 300 graines de pois d'angole et 120 sachets en plastique, peut produire une banque de fourrage qui peut fournir de l'aliment complémentaire pour ses animaux de trait et du bois de cuisine. S'assurez d'inclure les informations suivantes:

- Comment remplir les sachets.
- Comment traiter les semences de leuceana avant le semis.
- Quand semer les graines de leuceana.
- Combien de fois arroser les jeunes plants en pépinière.
- Comment choisir le lieu et préparer le sol pour la transplantation.
- Quand et comment transplanter les jeunes plants.
- Quand et où planter la clôture vivante de pois d'angole.
- Comment conduire la banque de fourrage la première année (sarclage).

SOIR

THEME 26. La paire et le mono-boeuf.

Quels sont les avantages du mono-boeuf pour le sarclage?

MINISTERE DU DEVELOPPEMENT RURAL

DIRECTION GENERALE DU DEVELOPPEMENT RURAL
CULTURE ATTELEE D.R.D.R. REGION
DE LA KARA.

REPUBLIQUE TOGOLAISE
Union-Paix-Solidarité

II. LE SARCLAGE MECANIQUE

Journée de Démonstration Pratique

Secteur: _____

Personnel de la surveillance technique:

Sous-secteur: _____

Village: _____

Date de Séance: _____

Nom du Paysan
Vulgarisateur: _____

Son Encadreur: _____

Nombre de Paysans
pratiquant la culture
attelée présents: _____

Membres du Jury:

Nombre d'encadreurs
présents _____

Nombre de participants au concours: _____

Thèmes choisis pour la séance:

I. Le Sarclage Mécanique.

Objectif: Fournir aux paysans les techniques et les matériels nécessaires à l'utilisation de leurs animaux de trait et leur équipement d'une manière efficace au cours de le sarclage mécanique.

Matériels: D'utiles informations peuvent être trouvées sur les fiches techniques suivantes:
A. Fiches Techniques N° 9 et 11 de PROPTA.
B. Le Sarclage avec le Butteur aux Ailes de Sarclage.

Méthodes: A. Expliquer aux paysans les avantages du sarclage mécanique. Mettre un accent sur les points suivants:
1. Un pratiquant de culture attelée peut préparer et semer une grande superficie. Mais, s'il ne sarcle pas mécaniquement, il lui sera difficile d'avoir des champs propres.

II. LE SARCLAGE MECANIQUE

Journée de Démonstration Pratique
Région de la Kara

2. Si un paysan paie d'habitude la main d'oeuvre pour le sarclage de ses champs, avec l'acquisition d'une paire il peut sarcler mécaniquement entre les lignes et payer moins cher pour faire le sarclage à la main entre les plants.
3. Si un paysan fait le sarclage mécanique, ses animaux vont rester toujours dressés et c'est facile pour lui de travailler avec ces animaux.
4. Le sarclage mécanique est plus facile que le labour. La force de travail que les animaux déploient est faible, ainsi le paysan ne crie pas ni ne bat ses animaux comme il le fait au cours du labour.
5. Si le paysan utilise les engrais, le sarclage mécanique fait tôt permet à l'engrais de favoriser une bonne production que le développement des herbes.

B. Présenter l'équipement pour le sarclage et expliquer son utilisation.

1. La paire de boeuf avec le joug de sarclage.
2. Le mono-boeuf avec le collier, les traits et le palonnier.
3. La houe triangle pour le sarclage à plat.

Largeur entre les lignes:	Equipement à Utiliser:
0,40 m.	a. deux demi-socs patte d'oie. b. un soc patte d'oie et deux pics fouilleurs.
0,45 m.	un soc patte d'oie et deux demi-socs patte d'oie.
0,60 m.	trois socs patte d'oie.
0,80 m.	a. cinq socs patte d'oie. b. trois socs patte d'oie et deux demi-socs patte d'oie.

4. Le corps butteur monté aux ailes de sarclage (sarclage sur billons).

Largeur entre les lignes:	Equipement à Utiliser:
0,60 m.	les ailes de 20 cm.
0,70 m.	les ailes de 25 cm.

C. Expliquer aux paysans les principes et techniques impliqués dans le sarclage mécanique. Inclure les points importants suivants:

1. Pour faire un sarclage mécanique les cultures doivent être semées en lignes droites espacées également.
2. Pour éviter de détruire les cultures, la houe triangle devra être réglée au champ de façon que la largeur de la main sépare les plantes des socs extérieurs des deux côtés.
3. Il faut sarcler tôt et souvent. Le sarclage mécanique devra être fait lorsque les lignes de culture sont visibles. L'objectif du sarclage mécanique est la destruction des herbes quand elles sont petites avant qu'elles ne soient bien développées.
4. Pour qu'un sarclage soit efficace, les socs patte d'oie ou les ailes de sarclage doivent être tranchants.
5. Le sarclage mécanique est difficile dans un champ où il y a des herbes rampantes.

II. LE SARCLAGE MECANIQUE

Journée de Démonstration Pratique
Région de la Kara

6. Si le sarclage mécanique est suivi de pluie, les herbes ne meurent pas, et un autre sarclage est nécessaire dès que le sol devient sec.
7. Les ailes de sarclage devront être bien réglées de manière à gratter le flanc du billon pour enlever les mauvaises herbes.

II. La Pratique de Sarclage Mécanique:

Inviter les paysans de culture attelée présents à essayer le réglage de l'équipement et à faire le sarclage mécanique dans le champ que le paysan vulgarisateur aurait montré.

III. Le Concours de Sarclage:

Si le paysan vulgarisateur et les concurrents ont décidé de faire le concours de sarclage ensemble dans un même champ, ce champ devra être divisé en parts égales pour chaque concurrent. Chaque membre du jury tiendra la fiche d'évaluation

III. Concours de Sarclage (paire ou mono-boeuf) pour noter les concurrents. Après le concours, diriger une discussion à caractère critique de la performance de chaque concurrent.

Si le concours de sarclage devra avoir lieu chez chaque paysan participant, trouver un temps afin que le jury puisse se rendre chez chacun pour noter ses capacités de sarclage.

IV. Rafrachissement.

CULTURE ATTELEE D.R.D.R.
REGION DE LA KARA

FICHE D'EVALUATION (Concours)

III. Concours de Sarclage (paire ou mono-boeuf)

Date: _____

Secteur ou Agence: _____ Membre du Jury: _____

Nom et Prénoms des candidats	Zone d'encadrement	Expérience professionnelle
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Notation: 1 à 5 points

1: nul
2: médiocre
3: assez bien
4: bien
5: excellent

Notation des Candidats

Critères de Notation	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
A. Paire (P) ou Mono-boeuf (M)										
B. Entretien matériel (état actuel)										
C. Technique de réglage pour un bon sarclage										
D. Technique de commande des boeufs										
E. Technique de Sarclage (qualité)										
F. Rapidité au Labour										
Total des notes retenues										

PERFORMANCE OF PCA'S CREDIT COMPONENT

ANNEX B

Performance of PCA's Credit Program
in the Kara Region
(August 1983-December 1985)

KARA (Sector)	Number of Recipients	Total Amount of Animal Traction Package to Recipients (CFA)	Amount of Downpay- ments (CFA)	Amount of Yearly Loan Repayments Due (CFA)	Amount of Loan Repayments (CFA)	Amount of Yearly Loan Repayments Out- standing (CFA)	Average Loan (CFA)	Average Downpayment (CFA)	Average Yearly Loan Repayment (CFA)	Rate of Repayment
ASSOLI	15	3,081,317	710,000	240,057	178,363	61,694	158,000	47,333	36,676	74.30%
BINAH	12	1,539,272	135,000	303,724	144,000	159,724	117,023	11,250	27,149	47.41%
KOZAH	11	2,499,909	370,000	108,612	47,500	61,112	193,628	33,636	44,922	43.73%
KABOU	24	7,515,184	921,000	508,561	353,576	154,985	274,750	38,375	63,744	69.52%
DANKPEN	13	3,373,930	397,000	124,343	71,163	53,180	228,995	30,538	53,127	57.23%
DOUFELGOU	9	2,645,261	502,122	* -	-	* -	238,127	55,791	39,688	-
KERAN	16	2,723,294	268,000	392,275	285,009	107,186	153,456	16,750	35,602	72.68%
T O T A L	1100	123,378,167	3,303,122	1,677,572	1,079,691	597,801	194,868	33,382	42,987	64.36%

* debt cancelled due to double billing (item : cart)

Performance of PCA's Credit Program
 in the Savanes Region :
 (August 1983-December 1986)

SAVANES (Agence)	Number of Recipients	Total Amount of Animal Traction Package to Recipients (CFA)	Amount of Down- payments (CFA)	Amount of Yearly Loan Repayments Due (CFA)	Amount of Loan Repayments (CFA)	Amount of Yearly Loan Repayments Outstanding (CFA)	Average Loan (CFA)	Average Down- payment (CFA)	Average Yearly Loan Repayment (CFA)	Rate of Repayment
GANDO	60	6,900,183	1,775,940	1,065,126	1,072,187	(7,061)	85,404	29,599	26,890	100.66%
BARKOISSI	73	8,004,069	1,934,300	1,931,431	1,813,711	117,720	84,243	26,497	31,219	93.90%
BOMBOUAKA	77	12,146,888	2,352,560	1,895,655	1,522,753	372,092	127,199	30,552	33,561	80.33%
TIMBOU	61	9,651,971	1,731,250	1,954,897	1,895,672	59,225	129,848	28,381	36,217	96.97%
NAKI - EST	71	8,019,337	1,894,655	1,907,874	1,801,197	106,677	86,263	26,685	29,696	94.40%
TOAGA	15	1,689,315	371,520	-	-	-	87,853	24,768	26,749	-
T O T A L	357	46,491,763	10,060,225	8,754,983	8,105,520	649,463	100,135	27,747	30,722	93.25%

78

DRAFT ANIMALS TRAINED BY PCA

Draft Animals Trained by PCA
in the Kara and the Savanes regions

(KARA) CAT	1984	1985	1986	1987
SOUDOU	-	10	10	14
BINAH	6	4	6	24
SARAKAWA	-	-	-	30
KABOU	-	-	-	26
NAMPOACH	-	-	-	-
AGBASSA	90	200	96	147
ADJAITE	-	-	-	10
ATCHANGBADE	-	-	-	25
Sub Total	96	214	112	276

TOTAL = 698 Draft Animals in the Kara region

(SAVANES) CAT	1984	1985	1986	1987
GANDO	40	52	100	66
BARKOISSI	40	48	60	66
BOMBOUAKA	-	18	28	-
TIMBOU	6	15	14	-
NAKI - EST	4	-	-	100
TOAGA	2	4	4	-
Sub Total	92	137	206	232

TOTAL = 667 Draft Animals in the Savanes region

Extension Agents Trained by PCA
in the Kara and the Savanes regions

(KARA) CAT	1984	1985	1986	1987
SOUDOU	-	13	2	8
BINAH	1	14	-	27
SARAKAWA	-	14	-	-
KABOU	12	14	-	15
NAMPOACH	-	15	7	-
AGBASSA	130	116	134	26
ADJAIWE	11	22	20	5
Sub Total	154	208	163	81

TOTAL = 606 Extension Agents in the Kara region

(SAVANES) CAT	1984	1985	1986	1987
TANTIEGOU	-	38	-	40
GANDO	15	15	15	26
BARKOISSI	15	15	15	33
BOMBOUAKA	14	16	15	-
TIMBOU	23	23	23	-
NAKI - EST	22	22	22	32
TOAGA	6	15	10	10
GNALE	-	7	-	-
Sub Total	95	151	100	141

TOTAL = 487 Extension Agents in the Savanes region

FARMERS AND EXTENSION AGENTS TRAINED BY PCA

Farmers Trained by PCA
in the Kara and the Savanes regions

(KARA) CAT	1984	1985	1986	1987
SOUDOU	-	10	23	21
BINAH	13	2	3	22
SARAKAWA	6	6	35	30
KABOU	3	13	3	28
NAMPOACH	-	10	29	-
AGASSA	31	40	63	20
ADJAITE	8	10	16	26
ATCHANGBADE	-	-	-	20
LANDA-POZENDA	-	-	-	22
Sub Total	61	91	172	189

TOTAL = 513 Farmers in the Kara region

(SAVANES) CAT	1984	1985	1986	1987
GANDO	18	39	55	78
BARKOISSI	20	24	30	90
BOMBOUAKA	14	59	36	96
TIMBOU	24	70	38	126
NAKI - EST	40	74	79	88
TOAGA	4	6	44	96
Sub Total	120	272	282	574

TOTAL = 1.248 Farmers in the Savanes region

GROWTH OF OXEN TRACTION IN TOGO

GROWTH OF OXEN TRACTION IN TOGO:
NUMBER OF PAIRS BY REGION AND SOURCE

Year	Savanes	Kara	Centrale	Plateaux	Maritime	Total	Placed by	Placed by PCA	
							PROPTA	Savane	Kara
1982-83	2547	505	204	44	25	3324	-	-	-
1983-84	3214	637	257	55	32	4195	117	-	-
1984-85	3988	672	260	72	38	5029	128	63	25
1985-86	4950	710	262	95	44	6060	113	111	27
1986-87	6143	750	264	124	51	7331	232	149	42
1987-88	7623	792	267	162	60	8903	266	143	51

Source: PROPTA and PCA 1987 Annual Report

Cost Per Steer Ex-Farm (FCFA):

Including All Costs	106806	87009
Excluding Cost of Lost Private Sector Meat Production	103056	85134
Excluding Fixed Costs	72194	69704
Excluding Steer Acquisition Costs	63306	43509
Excluding Fixed and Steer Acquisition Costs	28694	26204

Footnotes:

- (a) Assuming five hectares of traditional pasture can produce 10 kilos of meat per year from one animal unit.
- (b) Available without charge from government ranch 12 kilometers away. Provided for six months only.
Includes full cost of transport at 200 FCFA/km for a 10 ton vehicle carrying five tons of baled hay.
- (c) Assuming purchase price of animals is financed for 12 months and other operating costs are financed for an average of six months.
- (d) Average investment over life of project is one-half of the initial investment assuming no salvage value.

COST OF RAISING STEERS AT NAMIELE FOR ONE YEAR

Number of Animal Units(AU)	240	480
Assumptions:		
Area of Ranch (Ha)	1500	1500
Weight of Steers at Purchase(kgs)	145	145
Weight of Steers at Sale(kgs)	180	180
Annual Mortality Rate	10.0%	10.0%
Purchase Price of Steers(FCFA/Kg)	270	270
Salvage value of Dying Animals(FCFA)	8000	8000
Average Roundtrip Distance for Animal Pickup	350	350
Average Total Costs/Kilometer for 10 Ton Truck	200	200
Exchange Rate (FCFA/\$)	300	300
Investment Costs (FCFA):		
Buildings	7200000	7200000
Fencing and Quarantine Parks	23700000	23700000
Water System	3750000	3750000
Pick-up	3000000	3000000
Motorbike	300000	300000
Land (a)	-	-
Total Investment Costs	37950000	37950000
Operating Costs (FCFA):		
Purchase of Steers	9396000	18792000
Transport to Farm of Steers @ 20 steers per load	840000	1680000
Cotton Seed @ 240 kgs per year per AU @ 12 FCFA/kg	691200	1382400
Peanut Hay (b) @ 900 kgs per year per AU @ 1 FCFA/kg	216000	432000
Salt @ 50 grams per day per AU @ 200 FCFA/kg	876000	1752000
Veterinary Supplies @ 3 treatments/AU/yr @ 700 FCFA/ea	504000	1008000
Dipping @ 35 treatments/AU per year @ 25 FCFA/ea	210000	420000
Vehicle Operations:		
Pickup @ 6000 kilometers per year @ 65 FCFA/km	390000	390000
Motorbike @ 6000 kilometers per year @ 25 FCFA/km	150000	150000
Salaries:		
Veterinary Agent @ 3 months per year @ 80000 FCFA/mo	240000	240000
Herders @ 12 months per 60 AU @ 15000 FCFA/mo	720000	1440000
Guardians @ 24 months @ 10000 FCFA/mo	240000	240000
Interest on Operating Costs (c) @ 11%	1312506	2569512
Total Operating Costs	15786006	30495912
Fixed Costs (FCFA):		
Annual Depreciation:		
Buildings and Structures @ 20 years straight line	547500	547500
Fencing @ 20 years straight line	1185000	1185000
Vehicles included in milage charge	-	-
Interest on Investment (d) @ 13% on one-half of investment	4933500	4933500
Cost of Lost Meat Production @ 2 kgs of lost meat/ha @ 270 FCFA/kg	810000	810000
Total Fixed Costs	7476000	7476000
Total Costs (FCFA)	23262006	37971912
Less Salvage Value of Dying Steers	-192000	-384000
Net Cost of ANTRAK Steers	23070006	37587912

ECONOMIC ANALYSIS

The Project Paper noted the difficulty of measuring the economic results of animal traction. More so than with other agricultural inputs, the benefits of animal traction are related to non-animal traction elements in the package. These, in turn, are a function of the amount of time a farmer has been using animal traction, the training he has received, and the extent to which he has the resource base required to utilize the technology efficiently. Any dynamic analysis of animal traction, therefore, necessarily requires the use of assumptions regarding how well and how completely the package will be used in a particular situation.

Even a well executed study of the results obtained by an existing group of animal traction farmers would not provide the data necessary for a correct analysis, unless one assumes that those farmers have already attained their full potential with the technology. This is seldom the case with respect to animal traction. It is equally true that the magnitude of the benefits a farmer obtains from the technology can be greatly increased if its delivery is accompanied by an effective training and input supply program.

B.1 The Benefits of Animal Traction

Animal traction increases yields both directly and indirectly. Directly, it can increase yields most where traditional land preparation is less intense; where timely planting is essential and circumstances allow time for land preparation before the timely planting date; and where animal traction is used to overcome weeding bottlenecks. Plowing leads to better soil structure and water retention capability. Roots more thoroughly penetrate the soil, exploit available soil nutrients and moisture. However, unless accompanied by applications of soil nutrients, the benefit of better root penetration, as opposed to better soil moisture retention, will dissipate rapidly as available nutrients are mined from the soil. Better weeding, on the other hand, is a permanent and sustainable improvement.

Indirectly, animal traction can increase yields by facilitating the dissemination and use of other output increasing technologies such as improved seed, fertilizer, manure and improved spacing.

Estimates of the gains in yield arising from animal traction vary all over the place. In large measure, this variation arises from differences in the circumstances under which animal traction is applied. But the methodologies used to estimate the gains also vary greatly. High estimates tend to be based on research station results, subsamples of above-average farmers or estimates of highest likely yields. They rarely include the output of farmers who had a crop failure or who did not apply the technology properly. Estimates derived from interviews by extension agents are notoriously unreliable and must be confirmed with at least a small

sample of farmers selected at random.

The increase in average yield expected by the project design team was 20%, excluding other output increasing factors. This was supported by a major survey conducted in the eastern region of Burkina Faso which attempted to isolate the effects of animal traction. Results of studies done in Togo show from zero to 26% increases. Except for the SOTOCO (1987) study, however, the studies usually include the effect of all factors, not just animal traction. Table A8-1 summarizes the findings of four such studies. On that basis, the evaluation team estimates that the maximum increase in yields due to all factors for most crops ranges between 20-25%. The project has no data of its own to compare with these estimates. These average yields may increase with time as farmers become more familiar with their animals, but not unless there is considerable investment in additional extension training. Such further increases are not, therefore properly attributed to the TAT project.

The area expansion benefits of animal traction are well known but less well documented. The reason is the complex of factors that lead certain types of farmers and not others to adopt animal traction in the first place. Cross-sectional analyses of animal traction frequently confuse differences in the types of farmers who find it profitable to adopt animal traction in the first place, with differences in what happens after a farmer has adopted the technology. Such comparisons usually show an increase in area cultivated that is the result of a larger household, a wealthier farmer or more progressive farmer or a larger landholding relative to the non-adopter, rather than to animal traction per se. The study done by Amegbeta (1987) appears to suffer from this problem. Only a before and after analysis of the same farm household as compared to a control group can reveal the net effect of animal traction. This is one of the reasons that ongoing monitoring of traction farmers is so important, not just baseline studies.

The Project Paper anticipated an area increase of 30% after five years from animal traction. The evidence on this count in Togo is not convincing. It may approach this in Kara Region where new lands settlement has been important, but not on the average established farm. In the Savanes region studies conducted by the PROPTA monitoring and evaluation unit using extension agents suggest almost a doubling of area. But examination of the questionnaire suggests that many farmers included land cultivated for others in their response. While this provides an estimate of the amount of land cultivated by animal traction, it does not permit an estimate of new area brought under cultivation because of the technology. Table A8-1 includes yield increases as estimated by the different studies done in Togo. The analysis used in this report assumes a net increase in new area cultivated of 19% over five years. PROPTA's monitoring and evaluation unit does not have a better indication of the magnitude of this variable.

In Africa one of the most under-realized benefits of animal traction is manure production. All over Africa soil fertility is a critical problem. Low soil organic matter content limits the ability of the soil to hold nutrients in the upper horizon where roots are concentrated. Manure not only adds nutrients, it adds organic matter that can increase the production response of crops to chemical fertilizer as well. In soils low in organic matter the combination of the two is frequently greater than either one alone.

A study of the value of manure production in an East Africa farming system by one of the authors estimated the amount of manure produced by a single adult bovine at three tons of utilizable manure per year. This requires the animal be stalled and bedded with reasonable care in order to garner the urine (one half of the value of manure is in the urine). Using data from research stations throughout Africa the study estimates that three tons of manure translates into 250 kilograms of increased grain production per bovine or 500 kilos per pair of oxen. Proper management of manure is not yet receiving the attention it deserves in the project.

Transport is another benefit that is frequently underestimated. Many farmers in the project area report earning 40,000-45,000 FCFA per year in transport activities alone. (Transport seems to be more common in the south than in the Savanes). But the savings in a farmer's own transport expenditures is equally valuable. This benefit is frequently ignored and would amount to about 7,500 FCFA per farm per year.

Meat production is one of the more controversial benefits of animal traction. On the one hand, a younger pair of oxen and a more rapid turnover of the pairs produces greater average weight gain per year and more benefits from meat production. On the other, an older animal produces more power and has a greater working capacity. In addition, a well trained animal gets easier to use with age. It enables a farmer to expand his pool of manpower by using young children who would not be able to handle a less well trained animal. Moreover, the older animal, when used in conjunction with a new oxen, can greatly reduce the amount of time and effort required to train the new animal and can train them better than would a farmer alone. Needless to say, the more experienced and better trained are the oxen, the easier a farmer finds it to execute field activities and the more likely he is to expand his area under cultivation or to cultivate for others with his animals.

The farmer who decides not to sell his animal with a frequency dictated by maximum meat production does so because the benefit exceeds what he could earn if he sold the animal and purchased a younger one. Thus, the benefit of increased meat production based on a rapid turnover of animals, say every five years, is a minimum estimate of the value of the older animals if kept

for purely agricultural benefits.

Farmers often begin doing custom work for other farmers once they master the technology themselves. In the Savanes Region a SOTOCO study (SOTOCO, 1987) of 82 antrac farmers found the average amount of custom work done to be over five days per year, with a value in excess of 25,000 FCFA per year.

One last benefit that economists tend to overlook is the reduction in drudgery that animal traction affords farmers. Yet this is the benefit most frequently cited by farmers themselves. While it may be somewhat esoteric to place a value on this, apart from any savings in total labor input, the benefit is nonetheless real and very substantial in farmers' eyes.

8.2 The Costs of Animal Traction

In contrast to the benefits of animal traction which are frequently overestimated, the costs are frequently underestimated. Time associated with animal traction includes more than the time spent in the field and in preparing the animals for fieldwork and bedding them down afterwards. The time and expense of getting feed, water and veterinary supplies and giving these to the animals, especially during the off-season, also must be considered. A farmer must invest time in securing and regularly applying bedding materials if he hopes to secure most of the value of the manure produced by the oxen. He must build a shelter for the animal and for hay for dry season feeding. He must take time during the cultivating season to gather hay. If he does transport or custom agricultural work with his animals he must invest some of his own labor as well.

There is also a capital cost to animal traction. Apart from depreciation and maintenance of the equipment there is interest on the value of the investment. To the extent a farmer invests his own money he will expect a return on his investment that is well in excess of the subsidized interest rates charged on animal traction loans from the projects or from the CNCA. Estimates of farm level interest rates in rural Togo made in the TRIPS Project Paper range between 50-75% per year for large loans in rural areas. To the extent a farmer values the reduction in drudgery afforded by animal traction he may accept a lower return. But it would be surprising indeed if an economic analysis demonstrated average returns of less than 25% to a farmer's own equity given the rapid expansion of animal traction that is occurring in the project area. High farm level interest rates create a powerful economic incentive to sell mature animals in order to realize their accumulated value.

Mortality of traction animals is a bit tricky to measure. On the one hand we have data from over 1000 animals placed by SOTOCO that reveal average mortality ranging from 1.5% in the Savanes Region to 12% in the Maritime Region. But these only include insur-

able mortality. Other animals died but not for insurable causes such as neglect of the health maintenance treatments, or poor animal care by the farmer. In the economic analysis used in this report we assume 3% mortality, net of the salvage value of dead animals.¹

8.3 The Returns to Animal Traction

Tables A8-2 to A8-5 present the crop budgets used to compare animal traction to manual cultivation in both financial and economic terms. The budgets rely heavily on input/output data provided by Amegbeto (1987). The essential difference between the financial and the economic analyses is in the prices attached to cotton and maize, both of which are significantly over priced relative to imports. Although fertilizer is heavily subsidized, the subsidy is applied to an artificially high accounting price attached to fertilizer imported in barter transactions. The subsidized price is not out of line with free market prices.

8.4 Sensitivity Analysis

Table A8-8 demonstrates the sensitivity of the results to changes in certain key assumptions that might explain this divergence between apparent financial returns and farmer behavior. Budgeting maintenance and repairs for equipment at 4% rather than 5%, the purchase price of a pair of oxen at 80,000 FCFA rather than 90,000 FCFA, and increasing transport and custom services revenues from 50,000 FCFA to 60,000 FCFA do not have much impact on the IRRs. A 30% increase in area cultivated versus the 19% used in the budget, farmer perceptions of needing to repay only 75% of their loans² and reducing care and maintenance for animals to one-half hour per day from one have more of an impact. If farmers attach no cost to the time spent caring for animals, either because they entrust them to herders during the off-season at no cost, or because they attach no value to the labor of women and children who might care for the animals, or because having animals is an element of prestige, then the returns get interesting, rising to nearly 25% with credit. All of these factors are mentioned in the literature as true in certain circumstances. If certain of the more likely changes in assumptions are combined then the returns rise above 20% on a cash basis and almost 30% with credit. These rates begin to explain what one observes occurring daily in the project area.

¹Most animals that die at the farm level are, in fact slaughtered just prior to death. The analysis assumes a salvage value of dying animals equal to 25% of the value of a similar healthy live animal.

²This does not explain the very rapid rate of adoption in the Savanes Region where repayment rates average above 95%.

TABLE A8-1
 AVERAGE YIELDS OF SELECTED CROPS
 AND AVERAGE INCREASE IN AREA CULTIVATED
 USING ANIMAL TRACTION VERSUS MANUAL METHODS:
 SELECTED SOURCES

Crop	Average Yields (kgs/ha)				Average Net Increase(kgs/ha)		Values Assumed in Economic Analysis	
	Amegbeto		FED-Kara		SOTED	SOTOCO	Manual	Antrac
	Manual	Antrac	Manual	Antrac				
Cotton	950	1200	800	1750	300	0	950	1200
Maize	1200	1800	1390	1850	300	0	1200	1500
Sorghum	700	800	790	770	100	0	700	770
Cowpeas	480	500	600	750	n.a.	0	500	600
Peanuts	900	1350	930	1200	n.a.	0	900	1200
Area Cultivated	4.30	5.40	n.a.	n.a.	n.a.	14%	4.20	5.00

Sources: AMEGBETO, Koffi Nenonene; 1987; "Etude Comparative de Rentabilite de la Culture Manuelle et de la Culture Attelee en Milieu Rural; Memoire presente a l'Universite du Benin, Ecole Superieure d'Agronomie; Lome.
 SOTED; 1986; "Evaluation de la Culture Attelee au Togo; Lome.
 SOTOCO; 1987; "La Culture Attelee Dans Les Savanes"; Atakpalme.

TABLE A8-2
CROP BUDGETS FOR MANUAL CULTIVATION:
FINANCIAL ANALYSIS

	Unit Price	Cotton	Maize	Sorghum	Compeas	Peanuts	Totals
Area Cultivated (ha)		0.9	1.3	0.9	0.7	0.4	4.2
Yields (kg/ha)							
Grain/Seed Cotton		950	1200	700	500	900	
Forage		0	2400	1400	1000	1800	
Prices (FCFA/kg):							
Grain/Seed Cotton		105	60	60	150	120	
Forage		-	5	5	10	10	
Seed		0	90	60	225	175	
Revenue(FCFA/ha):							
Grain/Seed Cotton		99750	72000	42000	75000	108000	316875
Forage		0	12000	7000	10000	18000	36100
Sub-Total Revenue		99750	84000	49000	85000	126000	352975
Inputs Per Hectare(kgs):							
Seed		n.a	20	13	25	50	
Fertilizer		400	145	130	0	125	
Labor (mandays/ha):							
Soil preparation		27	27	27	27	27	
Ridging		16	16	16	0	0	
Seeding		11	6	6	7	16	
Weeding		21	21	21	21	21	
Fertilizer Application/Spray		8	5	5	3	5	
Harvesting/Thrashing/Winnowing		69	24	12	45	72	
Sub-Total Labor		152	99	87	103	141	
Variable Cash Costs(FCFA/ha):							
Seed		0	1800	780	5625	8750	
Fertilizer		26000	9425	8450	0	8125	
Treatments		600	0	0	7000	0	
Hired Labor	490	8428	8428	8428	8428	8428	
Bags		0	1800	0	0	1350	
Transport		2850	1800	1050	750	1929	
Sub-Total Variable Costs		37878	23253	18708	21803	28582	107851
Fixed Costs (FCFA):							
Interest Paid	12%	1064	0	0	0	0	
Return to Operating Capital	24%	1966	1860	1497	1744	2287	
Sub-Total Fixed Costs		3030	1860	1497	1744	2287	8628
Net revenue(FCFA)		58842	58887	28795	61453	95132	236496
Net Revenue per manday(FCFA) per hectare (FCFA)		443	680	428	678	734	488 56309

TABLE A8-3
CROP BUDGETS FOR ANIMAL TRACTION FARM:
FINANCIAL ANALYSIS

	Unit Price	Cotton	Maize	Sorghum	Compeas	Peanuts	Totals
Area Cultivated (ha)		1.4	1.6	0.9	0.8	0.3	5.0
Yields (kg/ha)							
Grain/Seed Cotton		1200	1500	770	600	1200	
Forage		0	3000	1540	1200	2400	
Prices (FCFA/kg):							
Grain/Seed Cotton		105	60	60	150	120	
Forage		-	5	5	10	10	
Seed		0	120	60	250	175	
Revenue(FCFA/ha):							
Grain/Seed Cotton		126000	90000	46200	90000	144000	477180
Forage		0	15000	7700	12000	24000	47730
Sub-Total Revenue		126000	105000	53900	102000	168000	524910
Inputs Per Hectare(kgs):							
Seed		n.a	25	13	25	60	
Fertilizer		400	180	130	0	130	
Labor (mandays/ha):							
Clearing (a)		10	10	10	10	10	
Soil preparation		29	29	29	29	29	
Ridging		4	4	4	0	0	
Seeding		11	6	6	7	16	
Weeding		7	7	7	3	3	
Fertilizer Application/Spray		8	5	5	3	5	
Harvesting		69	24	12	45	72	
Sub-Total Labor		138	85	73	97	135	
Variable Cash Costs(FCFA/ha):							
Seed		0	3000	780	6250	10500	
Fertilizer		26000	11700	8450	0	8450	
Treatments		600	0	0	7000	0	
Hired Labor	490	5292	5292	5292	5292	5292	
Bags		0	2250	0	0	1800	
Transport		3600	2250	1155	900	2571	
Sub-Total Variable Costs		35492	24492	15677	19442	28613	127123
Fixed Costs (FCFA):							
Interest Paid	12%	1064	0	0	0	0	
Return to Operating Capital	24%	1775	1959	1254	1555	2289	
Sub-Total Fixed Costs		2839	1959	1254	1555	2289	10170
Net Revenue(FCFA)		87669	78549	36969	81003	137097	387617
Net Revenue per manday(FCFA) per hectare(FCFA)		674	986	579	890	1055	681 77523

Footnotes:

(a) Amortized over five years. Amount stated is 20% of total.

TABLE A8-4
CROP BUDGETS FOR MANUAL CULTIVATION:
ECONOMIC ANALYSIS

	Unit Price	Cotton	Maize	Sorghum	Compeas	Peanuts	Totals
Area Cultivated (ha)		0.9	1.3	0.9	0.7	0.4	4.2
Yields (kg/ha)							
Grain/Seed Cotton		950	1200	700	500	900	
Forage		0	2400	1400	1000	1800	
Prices (FCFA/kg):							
Grain/Seed Cotton		85	50	60	150	120	
Forage		-	5	5	10	10	
Seed		0	90	60	225	175	
Revenue(FCFA/ha):							
Grain/Seed Cotton		80750	60000	42000	75000	108000	284175
Forage		0	12000	7000	10000	18000	36100
Sub-Total Revenue		80750	72000	49000	85000	126000	326275
Inputs Per Hectare(kgs):							
Seed		n.a	20	13	25	50	
Fertilizer		400	145	130	0	125	
Labor (mandays/ha):							
Soil preparation		27	27	27	27	27	
Ridging		16	16	16	0	0	
Seeding		11	6	6	7	16	
Weeding		21	21	21	21	21	
Fertilizer Application/Spray		8	5	5	3	5	
Harvesting/Thrashing/Winnowing		69	24	12	45	72	
Sub-Total Labor		152	99	87	103	141	
Variable Cash Costs(FCFA/ha):							
Seed		0	1800	780	5625	8750	
Fertilizer		26000	9425	8450	0	8125	
Treatments		600	0	0	7000	0	
Hired Labor	430	7396	7396	7396	7396	7396	
Bags		0	1800	0	0	1350	
Transport		2850	1800	1050	750	1929	
Sub-Total Variable Costs		36846	22221	17676	20771	27550	103517
Fixed Costs (FCFA):							
Interest Paid	12%	1064	0	0	0	0	
Return to Operating Capital	24%	1884	1778	1414	1662	2204	
Sub-Total Fixed Costs		2948	1778	1414	1662	2204	8281
Net revenue(FCFA)		40956	48001	29910	62567	96246	208477
Net Revenue per manday(FCFA) per hectare (FCFA)		318	560	429	679	735	430 49637

TABLE A8-5
CROP BUDGETS FOR ANIMAL TRACTION FARM:
ECONOMIC ANALYSIS

	Unit Price	Cotton	Maize	Sorghum	Compeas	Peanuts	Totals
Area Cultivated (ha)		1.4	1.6	0.9	0.8	0.3	5.0
Yields (kg/ha)							
Grain/Seed Cotton		1200	1500	770	600	1200	
Forage		0	3000	1540	1200	2400	
Prices (FCFA/kg):							
Grain/Seed Cotton		85	50	60	150	120	
Forage		-	5	5	10	10	
Seed		0	120	60	250	175	
Revenue(FCFA/ha):							
Grain/Seed Cotton		102000	75000	46200	90000	144000	419580
Forage		0	15000	7700	12000	24000	47730
Sub-Total Revenue		102000	90000	53900	102000	168000	467310
Inputs Per Hectare(kgs):							
Seed		n.a	25	13	25	60	
Fertilizer		400	180	130	0	130	
Labor(mandays/ha):							
Clearing (a)		10	10	10	10	10	
Soil preparation		29	29	29	29	29	
Ridging		4	4	4	0	0	
Seeding		11	6	6	7	16	
Weeding		7	7	7	3	3	
Fertilizer Application/Spray		8	5	5	3	5	
Harvesting		69	24	12	45	72	
Sub-Total Labor		138	85	73	97	135	
Variable Cash Costs(FCFA/ha):							
Seed		0	3000	780	6250	10500	
Fertilizer		26000	11700	8450	0	8450	
Treatments		600	0	0	7000	0	
Hired Labor	430	4644	4644	4644	4644	4644	
Bags		0	2250	0	0	1800	
Transport		3600	2250	1155	900	2571	
Sub-Total Variable Costs		34844	23844	15029	18794	27965	123883
Fixed Costs (FCFA):							
Interest Paid	12%	1064	0	0	0	0	
Return to Operating Capital	24%	1724	1908	1202	1504	2237	
Sub-Total Fixed Costs		2788	1908	1202	1504	2237	9911
Net Revenue(FCFA)		64368	64248	37669	81702	137797	333516
Net Revenue per manday(FCFA) per hectare(FCFA)		500	810	580	890	1055	587 66703

Footnotes:

(a) Amortized over five years. Amount stated is 20% of total.

TABLE A8-6
FINANCIAL RETURNS TO ANIMAL TRACTION IN THE KARA AND
SAVANNES REGIONS OF TOGO, 1988
(FCFA)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16
Area Cultivated (ha)	4.2	4.4	4.6	4.8	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Net Revenue Increase/ha (FCFA)	0	5304	10607	15911	21215	21215	21215	21215	21215	21215	21215	21215	21215	21215	21215	
Additional Revenue From Animal Traction:																
Crop Production	0	23336	48794	76374	106075	106075	106075	106075	106075	106075	106075	106075	106075	106075	106075	
Transport	0	6250	12500	18750	25000	25000	25000	25000	25000	25000	25000	25000	25000	25000	25000	
Custom Operations	0	6250	12500	18750	25000	25000	25000	25000	25000	25000	25000	25000	25000	25000	25000	
Sale of Oxen	0	0	0	0	0	150000	0	0	0	0	150000	0	0	0	0	150000
Total Additional Revenue	0	35836	73794	113874	156075	306075	156075	156075	156075	156075	306075	156075	156075	156075	156075	150000
Additional Costs of Animal Traction:																
Labor:																
Care and Maintenance of Animals	45 days/yr @	490 FCFA ea	22050	22050	22050	22050	22050	22050	22050	22050	22050	22050	22050	22050	22050	22050
Transport and Custom Work	2 days/4500 @	490 FCFA/dy	0	2722	5444	8167	10889	10889	10889	10889	10889	10889	10889	10889	10889	10889
Feed Supplements	180 kgs/yr/ox @	15 FCFA/kg	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400
Hay	500 Kgs/yr/ox @	10 FCFA/kg	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000
Veterinary Supplies	3 Treat/yr/ox @	800 FCFA ea	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800
Mortality/Insurance	3% of value of oxen per yr		2700	3060	3420	3780	4140	4500	3060	3420	3780	4140	4500	3060	3420	3780
Maintenance & Repairs	5% of value of equipment/yr		12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000
Investment Costs:																
Equipment (a)		240000									240000					-120000
Oxen (b)		90000				90000					90000					
Total Additional Costs		386950	60032	63114	66197	69279	159639	68199	68559	68919	69279	399639	68199	68559	68919	69279
Net Benefits of Animal Traction:																
NPV @ 10.0% =		-386950	-24196	10680	47677	86796	146436	87876	87516	87156	86796	-93564	87876	87516	87156	86796
IRR																270000
Animal Traction Financed With Credit @: 8.0%																
Loan Receipts/Payments (c)		-277200	69427	69427	69427	69427	69427									
Net Benefits With Credit:																
NPV @ 10.0% =		-109750	-93622	-58747	-21750	17369	77009	87876	87516	87156	86796	-93564	87876	87516	87156	86796
IRR																270000

Footnotes:

- (a) Equipment is fully depreciated over 10 years. Salvage value in year 15 is 50%.
- (b) Oxen are replaced every five years, or their value in use exceeds the loss in the value of meat production.
- (c) Assuming 16% down and the remainder paid in five equal installments at 8% interest.

TABLE A8-7
ECONOMIC RETURNS TO ANIMAL TRACTION IN THE KARA AND
SAVANNES REGIONS OF TOGO, 1988
(FCFA)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16
Area Cultivated (ha)	4.2	4.4	4.6	4.8	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Net Revenue Increase/ha (FCFA)	0	4266	8533	12799	17066	17066	17066	17066	17066	17066	17066	17066	17066	17066	17066	17066
Additional Revenue From Animal Traction:																
Crop Production	0	18772	39252	61437	85329	85329	85329	85329	85329	85329	85329	85329	85329	85329	85329	85329
Transport	0	6250	12500	18750	25000	25000	25000	25000	25000	25000	25000	25000	25000	25000	25000	25000
Custom Operations	0	6250	12500	18750	25000	25000	25000	25000	25000	25000	25000	25000	25000	25000	25000	25000
Sale of Oxen	0	0	0	0	0	150000	0	0	0	0	150000	0	0	0	0	150000
Total Additional Revenue	0	31272	64252	98937	135329	285329	135329	135329	135329	135329	285329	135329	135329	135329	135329	150000
Additional Costs of Animal Traction:																
Labor:																
Care and Maintenance of Animals	45 days/yr @ 430 FCFA ea	19350	19350	19350	19350	19350	19350	19350	19350	19350	19350	19350	19350	19350	19350	19350
Transport and Custom Work	2 days/4500 @ 430 FCFA/dy	0	2389	4778	7167	9556	9556	9556	9556	9556	9556	9556	9556	9556	9556	9556
Feed Supplements	180 kgs/yr/ox @ 15 FCFA/kg	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400
Hay	500 Kgs/yr/ox @ 10 FCFA/kg	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000
Veterinary Supplies	3 Treat/yr/ox @800 FCFA ea	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800
Mortality/Insurance	3% of value of oxen per yr	2700	3060	3420	3780	4140	4500	3060	3420	3780	4140	4500	3060	3420	3780	4140
Maintenance & Repairs	5% of value of equipmnt/yr	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000
Investment Costs:																
Equipment (a)		240000									240000					-120000
Oxen (b)		90000				90000					90000					
Total Additional Costs		384250	56999	59748	62497	65246	155606	64166	64526	64886	65246	395606	64166	64526	64886	65246
Net Benefits of Animal Traction:		-384250	-25726	4504	36441	70084	129724	71164	70804	70444	70084	-110276	71164	70804	70444	70084
NPV @ 10.0% =		-549														
IRR @ 10.0%																
Animal Traction Financed With Credit @: 8.0%																
Loan Receipts/Payments (c)		-277200	69427	69427	69427	69427	69427									
Net Benefits With Credits:		-107050	-95153	-64923	-32986	657	60297	71164	70804	70444	70084	-110276	71164	70804	70444	70084
NPV @ 10.0% =		13470														
IRR @ 10.6%																

Footnotes:

- (a) Equipment is fully depreciated over 10 years. Salvage value in year 15 is 50%.
- (b) Oxen are replaced every five years, or their value in use exceeds the loss in the value of meat production.
- (c) Assuming 16% down and the remainder paid in five equal installments at 8% interest.

TABLE A8-8
 SENSITIVITY ANALYSIS OF FINANCIAL RETURNS
 TO ANIMAL TRACTION IN TOGO

Method of Financing	Internal Rate of Return on ANTRAC Investment	
	Cash	Credit
Assumptions:		
Representative (a)	13.0%	14.7%
Increase in Area Cultivated:		
None	10.0%	10.6%
30%	14.7%	17.1%
Maintenance & Repairs @ 4%	13.6%	15.6%
Oxen Purchased @ 80,000 FCFA	13.7%	15.6%
Transport & Custom Revenue Amounting to 60,000 FCFA/yr	14.4%	16.7%
Care and Maintenance of Oxen:		
1/2 hour per day	16.0%	19.2%
No Cost Percieved	19.1%	24.4%
Repayment of Only 75% of Loan	13.0%	18.4%
Combined Assumptions (b)	22.0%	29.4%

Footnotes:

- (a) Assumes 5% for equipment maintenance and repairs; 19% increase in area cultivated due to animals; 90,000 FCFA paid for the oxen; 50,000 FCFA earned from custom work and transport; and one hour/day for care and maintenance of animals.
- (b) Assumes 4% for equipment maintenance and repairs; 19% increase in area cultivated due to animals; 80,000 FCFA paid for the oxen; 60,000 FCFA earned from custom work and transport; and 1/2 hour/day for care and maintenance of animals.

EQUIPMENT AND TECHNICAL PROBLEMS

EQUIPMENT AND TECHNICAL PROBLEMS

1. Plow Yoke Design: The plowing yoke made by PCA at Agbassa Center has several problems:

- a. The bows are made of reinforcement rod (re-rod) that has a rough surface. This causes discomfort and, in many instances, injuries the animals, resulting in lost field time.
- b. The yoke stock (crossbar) is not broad enough or smooth enough to maximize the animals' pulling power. In many cases, the rough surface causes injuries.
- c. The yoke is too long, making it difficult to adjust the plowing width. In several instances, it was observed that farmers corrected the problem by having the right-hand animal walk on the plowed ground instead of in the furrow. This causes the animal to tire sooner.

2. Weeding Yoke Design: Weeding yokes made at Agbassa are made like the plowing yokes: stocks and bows are poorly designed. An equally serious problem is bow size, that is, the distance between the uprights. with bow size ranging from 20-23 cm, smaller animals have so much freedom of movement that a) they do not always walk in a straight line and, b) their shoulders do not come in contact with the bows, reducing their effective pulling power.

3. Single Animal Weeding Harness: The single animal collar harness ('mono-boeuf collier') manufactured at Agbassa Center lacks adequate padding at the draft--the point on either side of the collar where the trace (draw rope) connects to the draw ring. The draft should be lengthened and thickened to prevent shoulder galls. The current system of hanging a rope over the animal's back to serve as a trace carrier needs improvement: padding will reduce rope burns on the spine; a back strap will add stability to the harness.

4. Row Markers/Marking-Out System: An important failure of the project is that it has not developed an efficient marking-out system. Most of the farmers who practice mechanical weeding mark-out rows one at a time, using a cord. This system works fairly well in conjunction with the hand-pushed seeder, but is limiting when the system is to have several people plant by hand. It was observed during the evaluation that, in some cases, variation in row widths resulting from the cord method were enough to cause problems in mechanical weeding. The UPROMA animal drawn rod marker is difficult to use if animals are not well trained; the hand pulled unit is relatively expensive (9,250 CFA). The designs used by Project Vivrier have similar disadvantages, even though they are locally built. Several home-made markers, capable of marking 3-5 rows per pass (at varying distances) were seen in the Atchangbedé sub-sector. A simple test on plowed ground proved the. to be heavy enough to

leave a clear mark , but light enough to be pulled by hand. --2

5. Animal Performance/Training: A number of problems remain with the system used to train animals:

- some potential good draft animals are not being trained because they are more aggressive, and need special training. Use of a standard trip harness would permit animal trainers ('maitre dresseurs') to break these animals before beginning the regular training program.
- whip marks seen on animals during the evaluation indicated that animals are sometime abused. Farmers should be taught how to deal properly with animals that lay down or act up.
- few animal trainers use veteran animals to train new ones. This easy method of training animals should be introduced on a wider scale.
- most farmers continue to lead animals from the front rather than drive them from behind. Animal training programs should be based on line drive techniques.
- few animals are taught to work single, right or left in a hitch, or to back up. The use of these animals is limited by poor training.

PERSONS CONTACTED

PERSONS CONTACTED

LOME

Mark Wentling USAID (AID Representative)
 Sidney Bliss USAID (Rural Development Officer)
 Evelyn McLeod USAID (Program & Evaluation Officer)
 Bonnie Pounds USAID/Washington (Deputy Director, Africa)

Robert Nicholas Peace Corps (Director)
 Kodzo Amesefe Peace Corps (Associate Director)

ATAKPAME

Dr. Kossivi Apetofia PROPTA Director
 Arthur Westneat PROPTA/DAC (TA Economist)
 Abatekoue Klutse PROPTA (Division de Suivi et Evaluation)
 Lisa Schmidt PROPTA (Peace Corps Volunteer)
 M. Dogbe PROPTA (Chef, Division de la Formation
 et Matériel Agricole)

M. Assih PROPTA (Chef, Centre de Formation,
 Kamina)

Dr. Aku PROPTA (Chef, Division Santé Animale)
 Diogo Akouavi PROPTA (Responsable, Division de la
 Comptabilité)

Thassilo Von der Decken PROPTA (Formation et Matériel Agricole)
 M. Sambiani PROPTA, Chef du Centre, KAMINA

M. Mamah SOTOCO (Directeur)
 Kossi Abotchi SOTOCO (Directeur Adjoint)
 Yao Agoussou SOTOCO (Chef de Recherche d'Accompagnement)
 M. Napo SOTOCO (Division de Suivi et Evaluation)
 Lawson Latevi SOTOCO (Chef de Service Culture Attelée)
 Loho Kossi SOTOCO (Chef de Service des Moyens de
 Production et de la Commercialisation)
 Kodom Nyozu-Ngu SOTOCO (Adjouant Chef, Service Culture
 Attelée)

Bakolmde Djato Kossi SANTE ANIMALE (Chef de Poste)

Akakapo Kodjo DRDR (Chef, Division d'Aménagement &
 Maintenance)

Abalo N'Ledji Abdu DRDR (Chef, Coopération & Vulgarisation)

SOKODE

Pawazi Laodjassondo DRDR (Directeur)
 Dr. Moutique Domingo PROPTA (Chef, Division d'Approvisionnement
 en Animaux de Trait)

Dr. Tim Zeuner GTZ (Project Director)

KARA

Kokou Dake Dogbe DRDR/Kara (Director)
 Pakoubatcho Lekezime PCA Technical Coordinator

Georges Brunet	PCA (Conseiller Technique/ DAC Chief of Party)
Tom Cahalan	PCA (DAC Agronomist)
Dogbevi Kwami	PCA (Accountant/Credit Manager)
Peter Rice	PCA (PSC Equipment Specialist)
Ayayi Afantonou	UPROMA (Director)
M. Midekor	DRDR (Direction, Cooperation & Vulgarisation)
M. Ouro	CNCA (Responsable du Crédit)
Mme. Arejba	SOTOCO (Responsable du Crédit)
AGBASSA	
Nyassime Kpatcha	PCA (Directeur du Centre)
M. Barosse	PCA (Directeur de Formation)
M. Sago	PCA (Maître Dresseur)
KADJALLA	
Yassime Yao	Animal Traction Farmer
Adama Salifou	Livestock Herder
Sabi Dauoda	Livestock Herder/Merchant
Koumonde	Livestock Herder
Al Hadji Iite	Livestock Herder/Merchant
Yakoubou	Animal Traction Farmer
ADJAITE	
Yassim Funali	DRDR, Maître Dresseur
BROUKOU	
Moussa Daouda	Livestock Merchant
MADJATOM	
Arouna Maiga	Livestock Merchant
KARA REGION CAT AND EXTENSION PERSONNEL	
M. Aba	DRDR/Kara (Conseiller, Culture Attelée)
T. Dejean	DRDR/Kozah (Chef Secteur)
Simlakwe Baguetina	DRDR Agence Agbassa (Moniteur)
Marek Przewdzieki	PCV Bassar
Harold Tarver	PCV Massadena
Kambara Saramayanga	DRDR Atchangbadé (Chef Sous-Secteur)
Aketa Badjam	CAT Binah-Sud (Chef du Centre)
Abaha Tchehie	CAT Binah-Sud (Maître Dresseur)
Bata Wana Bilakani	CAT Binah-Sud (Maître Dresseur)
Charles Hayes	PCV Sara Kawa
Gary Wilder	PCV Atchangbadé
M. Adama	Blacksmith, Atchangbadé
SAVANES REGION	
Iyatan Sabi	DRDR/Savanes (Directeur)
M. Sewa	DRDR/Savanes (Chef de Division de la Coopération et Vulgarisation)

M. Nadjombe	PROPTA/Savanes
Oni Kokouvi,	SOTOCO/Savanes (Directeur Régional)
Amegavi Komi	SOTOCO/Savanes (Comptable/Crédit)
Dr. Odou Loro	Chef d'Inspection Veterinaire (Savanes)
Joseph Howell	PROPTA/DAC Livestock Specialist
M. Bawa	DRDR Agronomist

SAVANES REGION CAT AND EXTENSION PERSONNEL & OTHER INFORMANTS

Farmers of Groupement No. 1, Barkoissi	
Ali Soga	CAT Barkoissi (Chef du Centre)
James Blem	PCV, Mango/Nagbeni

BIBLIOGRAPHY

BIBLIOGRAPHY OF DOCUMENTS CONSULTED

USAID DOCUMENTS

Allingham, Katherine; 1984; "A Contribution to the Study of the Sustainability of Animal Traction Systems in Northern Togo"; Lome.

Final Evaluation of the USAID/Togo Rural Water Supply and Sanitation Project. February 1988.

Havlovic, Martin; 1984; Final Report: Togo Animal Traction Project; Lome.

Togo Animal Traction Development. 693-0218. Project Identification Document. May 1982.

Togo Animal Traction Development. 693-0218. Project Paper. January 1983.

Togo Animal Traction Development. 693-0218. Project Evaluation. May 1985.

Togo Animal Traction Development. 693-0218. Project Paper Amendment, February 1986.

Togo Animal Traction Development. 693-0218. Project Grant Agreements:

- No.1, August 1983;
- No.2, February 1984;
- No.3, April 1985;
- No.4, April 1986;
- No.5, January 1987;
- No.6, June 1988.

Togo Animal Traction Development, 693-0218. Project Implementation Reviews:

- 9 June 1988.
- 15 April 1988
- 31 october 1987
- 18 November 1986
- 19 May 1986

Winner, Bruce; Undated; Final Report: Projet Culture Attelee; Lome.

Diverse correspondence, memoranda, financial, administrative and technical documentation.

GOVERNMENT OF TOGO DOCUMENTS

Ministère du Développement Rural; Direction Générale du Développement Rural; 1981; Evaluation du Projet: Opération de Mise en Valeur Agricole dans la Vallée de la Kara; Kara.

Ministère du Développement Rural; Projet de Développement de l'Élevage Bovin Dans la Région des Plateaux et la Région Centrale; 1983; Etude sur la Rentabilité de la Traction Animale et les Subventions Accordées au Togo.

Ministère du Plan, de l'Industrie et de la Réforme Administrative; 1983. Etude de Synthèse et de Diagnostic du Secteur Rural: Rapport Préliminaire; Lomé.

Ministère du Développement Rural; Direction Générale du Développement Rural; 1984; Rapport Annuel, Campagne 1983, Project Culture Attelée; Kara.

Ministère du Développement Rural; Direction Générale du Développement Rural; 1984; "Rapport Annuel 1983-1984: Centre de Dressage et de Formation d'Agbassa"; Kara.

Ministère de Développement Rural; Direction Générale du Développement Rural; Culture Attelée DRDR Région de la Kara et des Savanes; 1985; "Fiches Techniques à l'Usage des Agents d'Encadrement"; Kara.

Ministère du Développement Rural. Nouvelle Stratégie du Développement Rural. Mars 1985.

Ministère du Développement Rural; Direction Générale du Développement Rural; Culture Attelée DRDR Régions de la Kara et des Savanes; " Fin de Campagne 1985: Résultats des Démonstrations et la Recherche, D'Accompagnement aux Centres d'Appui Technique."

Ministère du Développement Rural. Direction Générale du Développement Rural. 1986; Document de Base sur le Système Togolais d'Encadrement Rural.

Ministère du Plan et de l'Industrie; Direction Générale du Plan et du Développement; 1986; Evaluation de la Culture Attelée au Togo; Lomé.

Ministère du Développement Rural; Direction Générale du Développement Rural; Culture Attelée DRDR Régions de la Kara et des Savanes; 1986; "Campagne Agricole 1985-1986: Rapport Annuel P.C.A./K-S."

Ministère du Développement Rural; Direction Régionale du Développement Rural; Secteur du Développement Rural Kozah; 1988; Rapport Annuel 1987.

Diverse correspondence, memoranda, financial, administrative and technical documentation.

PCA DOCUMENTS

Development Assistance Corporation; 1985; Technical Assistance Team Report. Kara.

Development Assistance Corporation; 1986; Technical Assistance Team Report; Kara.

Development Assistance Corporation; 1987; Technical Assistance Team Fourth Annual Report.

Development Assistance Corporation; 1987; Performance Report I; Kara.

Development Assistance Corporation; Project Implementation Reports:

- March 1988;
- October 1987;
- October 1986.

Komassi K. Agbedo; 1987; Le Système Comptable et Financier du Projet Culture Atelée au Niveau des Centres d'Appui Technique (CAT); Kara.

Les Procès-Verbaux des Réunions Mensuels & Trimestrielles du PCA: Février 1985-Mai 1988.

Procès Verbal de Contrôle des Comptes Financiers et des Documents Comptables du Projet Culture Atelée DRDR/Kara et Savanes du 15 Février au 26 Février 1988; Kara.

Projet Culture Atelée, DRDR Kara et Savanes; 1988; Rapport Annuel 1987.

Diverse correspondence, memoranda, financial, administrative and technical documentation.

PROPTA DOCUMENTS

Nadjombe; (Undated); Etude sur l'Usure des Pièces de Rechange dans la Région des Savanes; Atakpamé.

Nadjombe; (Undated); Etude sur l'Usure des Pièces de Rechange au Nord du Togo; Lomé.

Projet de Développement de l'Elevage Bovin dans la Région des Plateaux et la Région Centrale (PRODEBO); 1983; Rapport Annuel d'Activités; Atakpamé.

PROPTA; 1983; Proposition de Financement; Atakpamé.

PROPTA; 1984; Rapport Annuel des Activités du PROPTA, 1983-84; Atakpamé.

PROPTA; 1985; Situation Actuelle de la Traction Animale au Togo; Atakpamé.

PROPTA; 1985; Rapport Annuel des Activités du PROPTA, 1984-85; Atakpamé.

EVALUATION SCOPE OF WORK
ANIMAL TRACTION PROJECT EVALUATION

June 9 - July 6, 1988

Questions and Scope of Work for the Evaluation Team*

Agricultural Economist

A. General Questions

1. Extent to which inputs applied have produced proposed outputs.
2. Extent to which progress has been made towards achieving project purpose (EOPS).
3. Extent to which there has been an impact on the project goal.
4. Adequacy of project design in meeting project purpose.
5. Extent to which targets were revised, and why.
6. Extent to which project results were obtained at least cost.
7. Extent to which inputs were supplied as expected.

B. Technical Questions

1. PROPTA

- a. Extent to which the monitoring/evaluation system and improved information flow affect decision making.
- b. Development of Namiele holding/quarantine center.

2. Animal Supply

- a. Suitability of costs and performance of the PROPTA animal supply system.

*Per June 9, 1988 meeting. Participants: Sid Bliss, Evelyn C. McLeod, Tom Zalla and Peter Watson

3. Credit

- a. PROPTA's initiatives in rationalizing project's credit and subsidy terms.
- b. Adequacy of project management of the government's credit component for project farmers in the Kara and Savanes regions (DRDR-zones).
- c. Current repayment rates for adopters under this project as well as for farmers who received equipment and animals on credit under the previous pilot project.
- d. Adequacy of project management of credit reflows.

C. Scope of Work

1. Coordinate with OAR/Lome Rural Development Officer (the project officer) and the Evaluation Officer on the schedule for the team for the duration of the evaluation, the logistical arrangements, team's workplan, the design and data collection methodologies to be used for the evaluation, ensuring that resources are adequate to fulfill evaluation requirements in a timely manner, and in preparing the evaluation report.
2. Finalize the evaluation report.
3. Prepare the economic analysis. The analysis will include, but not be limited to, a consideration of the following aspects of the project:
 - a. Comparison of actual costs and benefits to those which were imputed to the introduction of animal traction in northern Togo, as presented in the Project Paper;
 - b. An examination of significant secondary economic benefits (and/or disadvantages) to the adoption of animal traction;
 - c. A.I.D. gradual withdrawal of direct institutional support of PROPTA and DRDR Kara/Savanes, the probable financial effect on these institutions, and possible alternate means of resources, or of according greater responsibility to private sector entities involved in supply and services;

NOTATION: This area will be jointly analyzed by the AE and the Farming Systems Specialist.

- d. Cost-effectiveness of the various means of draft animal procurement and distribution used by the project;
- e. Appreciation of the program(s) of monitoring, evaluation and studies practiced by PROPTA and PCA;
- f. Examination of the credit system used by PCA: internal management, recuperation of credit in the field; prospects for maintaining a revolving fund after A.I.D. assistance is completed.

Animal Traction Specialist

A. General Questions

None

B. Technical Questions

1. Extension vs Research

- a. Extent to which the technical package is being sufficiently adapted to on-farm conditions, so that farmers can profitably adopt it.
- b. Extent to which a sufficient number of adaption trials have been organized.
- c. Whether a follow-on activity should promote further extension, or support a more concentrated research activity prior to extension; or is there some middle ground suggested, such as an adapted "training and visit" system.

2. PROPTA

- a. Extent to which the monitoring/evaluation system and improved information flow affect decision making.
- b. Composition of animal traction equipment package.

3. Extension Management

- a. Adequacy of services rendered by DRDR and SOTOCO extension agents, after receiving training from project.
- b. Adequacy of national cadre and field personnel to undertake an annual campaign which covers the range of animal traction activities (animal supply, selection of farmers, training, animal health, re-training, monitoring - including basic statistical gathering and compilation) without assistance from external sources.

- c. Extent to which the introduction of zone-based technical resource centers (CATS) has had an effect in the promotion of animal traction.

4. Animal Supply

- a. Success or problems of targetting farmers who already own suitable animals.
- b. Timeliness of provision of equipment and animals to project farmers.

C. Scope of Work

1. Determine the appropriateness (practicality) of the introduction and promotion of animal traction-related technology in northern Togo, particularly through an examination of the complex set of technical packages which accompany such a system. (In this regard, the ATS will second the investigation by the FSS of the appropriateness of animal traction from a more agronomic and socio-economic perspective.) The ATS will focus his consideration of the question on those technical packages which were developed, recommended and extended through the auspices of the A.I.D.-funded project, either through the central organization of PROPTA, or through the field extension and resource units of the DRDR in the Kara and Savanes regions.
2. The ATS consideration of means and methods utilized under the project will include, but not be limited to, examination of the appropriateness of:
 - a. draft animal selection (including a discussion of the system(s) of procuring and distributing animals);
 - b. equipment packages (including an examination of the policies in force relative to limitations in acquisition of certain implements);
 - c. cropping systems recommended for use in various zones, according to soil types, rainfall;
 - d. training programs (including demonstrations, ag fairs, seminars, etc.) at all levels for field (extension) personnel, including farmers;

- e. artisanal involvement in locally-based support systems for animal traction units (in relation to public sector involvement in equipment spare parts and repairs);
 - f. zone-based technical resource centers (CATs) as a complement to programs of extension, research, equipment supply, and animal health.
3. Appreciation of the program(s) of monitoring, evaluation and studies practiced by PROPTA and PCA.

Farming Systems Specialist

A. General Questions

- 1. Extent to which the project contributes to promoting the objectives of A.I.D. development strategy in Togo and to Togolese government objectives.
- 2. Extent to which the private sector can contribute to the development of animal traction in Togo.

B. Technical Questions

1. PROPTA

- a. Adequacy of PROPTA's administrative, managerial, personnel and financial capacity to carry out its mandate on a sustainable basis.
- b. Extent to which PROPTA has acted or assisted in relieving constraints to the promotion of animal traction.
- c. Extent to which PROPTA has moved certain of its present responsibilities to more appropriate structures (governmental or private).
- d. Extent to which there is a real cooperation and exchange between PROPTA and projects; PROPTA and the government animal health service (and other appropriate services).
- e. Extent to which PROPTA is improving the flow of information among projects.

f. Extent to which the monitoring/evaluation system and improved information flow affect decision making.

g. Proposed restructuring of PROPTA.

2. Extension Management

a. Adequacy of financial and technical management of the CATs.

b. Extent to which the CATs are integrated into government's extension system.

3. Animal Supply

a. Extent to which PROPTA management of the EEC revolving funds assist or impede the timely supply of animals and equipment to farmers.

b. Extent to which PROPTA is working to encourage private marketing channels to deliver suitable draft animals to farmers.

C. Scope of Work

1. Examine the extent to which project planning, implementing, and monitoring have been consistent with a farming research/extension standard.

2. Ensure that questions are addressed relating to whether animal traction is appropriate in northern Togo; and if so, what form(s) of animal traction. (Notation: The FSS will respond to these questions from a farming-systems perspective, taking into account the characteristics that a farm-oriented project exhibits: farmer based, problem solving, comprehensive, interdisciplinary, iterative and dynamic, responsible to society and developmental.)

In this examination, the more technical aspects of animal traction - suitability of draft oxen, the equipment packages and the suggested cropping systems, the FSS be seconded by the Animal Traction Specialist member of the evaluation team.

3. Assist in the preparation of the economic analysis by examining:
 - a. project institutional support to PROPTA;
 - b. project institutional support to the DRDR in Kara and Savanes in the reinforcement of a division responsible for animal traction;
 - c. A.I.D. gradual withdrawal of direct institutional support of PROPTA and DRDR Kara/Savanes, the probable financial effect on these institutions, and possible alternate means of resources, or of according greater responsibility to private sector entities involved in supply and services;
 - d. appreciation of the program(s) of monitoring, evaluation and studies practiced by PROPTA and PCA.

REPORT REQUIREMENTS

The evaluation report will include the following information:

1. Basic Project Identification Data Sheet (to be provided to the team);
2. Executive Summary. No more than three pages, single space;
3. Table of Contents;
4. Body of the Report. The report should include a description of the country context in which the project was developed and carried out, and provide the information (evidence and analysis) on which the conclusions and recommendations are based. The general length of the report should not exceed 40 pages. Details would be included in Appendices or Annexes.
5. Conclusions. These should be short and succinct, with the topic identified by a short subheading related to the questions posed in the Statement of Work.
6. Recommendations. These should correspond to the conclusions; wherever possible, the recommendations should specify who, or what agency take the recommended actions.
7. Appendices. These are to include at a minimum the following:
 - a. the evaluation Scope of Work;
 - b. the pertinent logical framework(s), together with a brief summary of the current status/attainment of original or modified inputs and outputs (if these are not already indicated in the body of the report);
 - c. list of actions taken, and status of actions not yet taken but still considered valid by the evaluation team, based on the recommendations of an earlier evaluation of the project(s) or program(s);
 - d. a description of the methodology used in the evaluation (e.g., the types of indicators used to measure change of the direction/trend of impacts, how external factors were treated in the analysis). Evaluators may offer methodological recommendations for future evaluations;
 - e. a bibliography of documents consulted.
8. Persons contacted.

Other appendices may include more details on special topics, and a list of agencies consulted.